PROGRESSIVE ARCHITECTURE

RAILROAD DORMITORIES

HOUSES

DAYLIGHTING

FEBRUARY 1946

Jenkins PRACTICAL PIPING LAYOUTS

How to Plan FUEL OIL PREHEATER AND PUMP CONNECTIONS

Another in the series of basic Piping Layouts prepared by Jenkins Bros.

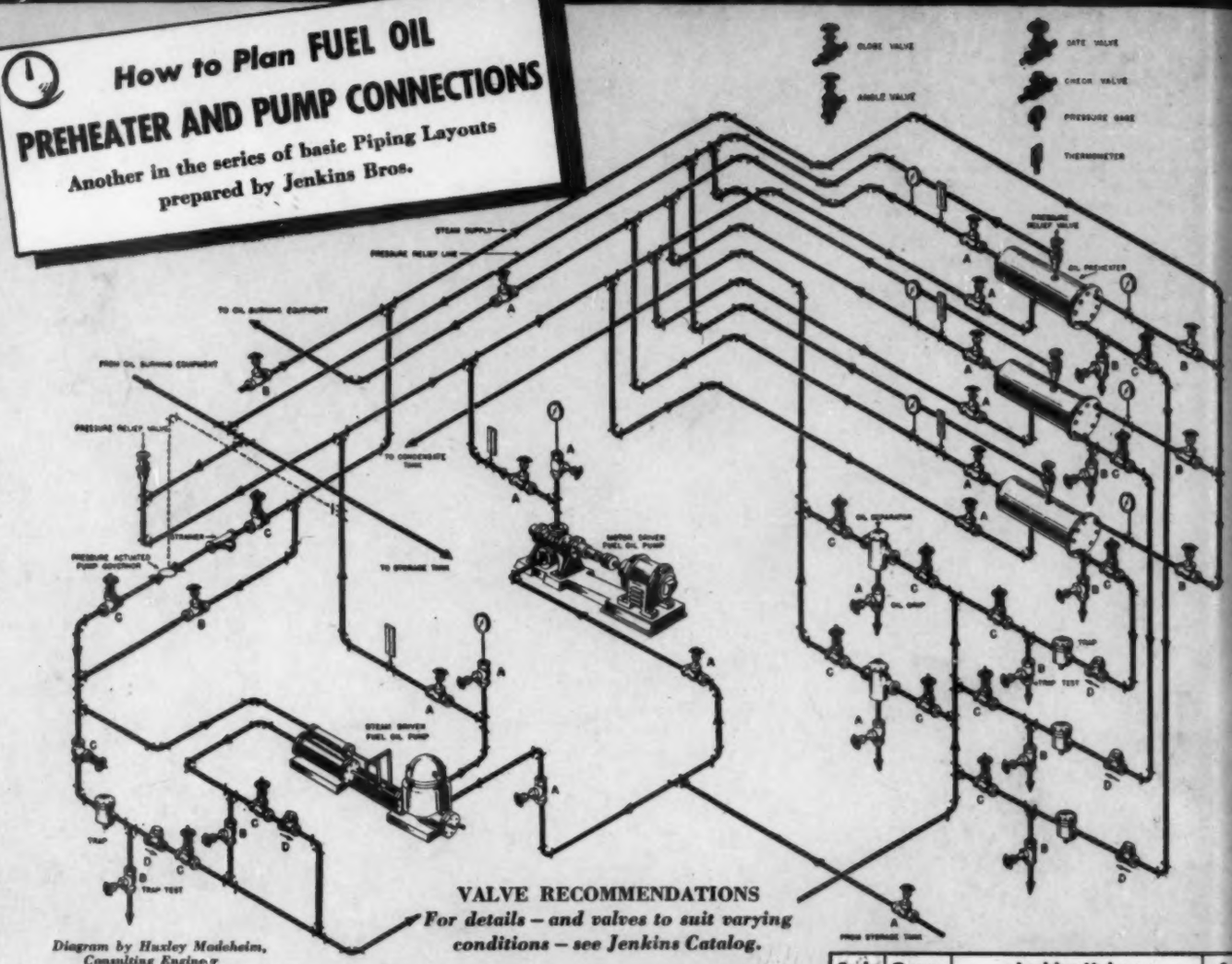

Diagram by Huxley Madeheim, Consulting Engineer

VALVE RECOMMENDATIONS
For details – and valves to suit varying conditions – see Jenkins Catalog.

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A	16	Fig. 970 Regrind-Renew Br. Globe	Oil Lines
B	13	Fig. 950 Regrinding Br. Globe	Steam Lines
C	15	Fig. 275 O.S.&Y. Br. Gate	Steam Lines
D	5	Fig. 92 Bronze Swing Check	Steam Lines

Preheaters and Pumps are necessary for conditioning fuel oil for furnaces used for heating or power.

Continuous Circulation to and from the burners is provided in this layout showing preheaters and pumps in lines originating at, and returning to the storage tanks.

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FEBRUARY 1946

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COVER: Composition by Gene Hawley. Photograph by Robert Damora.

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1946 Architectural Competition

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6 third prizes of $300 each	1,800

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Edward A. Stone
Robert Allan Jacobs, A.I.A.
Russell F. Whitehead, A.I.A.
Frederick J. Woodbridge, A.I.A.

PROFESSIONAL ADVISER

Kenneth Reid, A.I.A. conducting the competition for Bloomingdale's

THE WINNERS

in the Chicago Tribune's $24,000.00 Chicagoland Prize Homes Competition

The Jury of Awards, appointed by the Chicago Tribune to select the prize winning entries in the Chicagoland Prize Homes Competition, met in executive sessions on December 26 and 27, 1945.

Boyd Hill, A.I.A., appointed by the Chicago Tribune to act as Professional Adviser in conducting the competition, reported that a total of 938 entries had been received. All 938 entries submitted in the competition were examined by the Jury of Awards which selected the entries of the following persons as winners of the 24 individual prizes of $1,000.00:

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River Forest, Illinois

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630 E. 84th Street
Chicago 19, Illinois

HOWARD J. UEBELHACK
1772 Washington Avenue
Wilmette, Illinois

To the winners, the Chicago Tribune extends its congratulations. To all entrants in the competition, and to the following members of the Jury of Awards, the Chicago Tribune wishes to express its sincere thanks for their cooperation: Paul Gerhardt, Jr., A.I.A., Chairman; Philip B. Maher, F.A.I.A., Co-chairman; Irvin A. Bletz, builder; Arthur E. Fossier, builder; John O. Merrill, A.I.A.; J. E. Merrion, builder; John R. O'Connor, builder; John W. Park, architect, and A. N. Rebori, architect.

The winning designs will be reproduced in full color in the Chicago Sunday Tribune, starting in February.

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THIS MONTH

LESTER C. TICHY

The advanced type of building presented in this issue as **2 Dormitories for Railroad Men**, page 46, was designed by Lester C. Tichy, New York, whose current work for the Pennsylvania Railroad we brought to the attention of our readers in July, 1945, with publication of three of his small stations for "Railroading of Tomorrow." Active as an architect and industrial designer, he recently won first prize in the *House & Garden* architectural contest for 1945—also second prize in the General Motors competition last year.

George Nemeny's Small Country House, Alpine Woods, N. Y., page 63, is of interest because it exemplifies the application of contemporary design techniques for production of a very simple small house. It is particularly imaginative in detailing. Nemeny is better known for his housing work, especially his "modern" speculative homes built in New York's metropolitan area, though his practice has included factories, Westchester County houses, and other work. He also worked, 1942-44, as a project planner for FPHA. Before opening his own office in 1938, Nemeny gained experience with prefabrication, in the office of William Van Alen. A native of Hungary, he came to this country in 1920 and received his education here, including architectural training at Cornell University.

GEORGE NEMENY

•

A husband-and-wife team designed the contemporary houses comprising **Little Switzerland, Knoxville, Tenn., page 66.** They are Alfred and Jane West Clauss, now of Philadelphia, where Clauss is associated with George Daub, architect. The houses shown in this issue were done while Clauss was a designer for TVA. He tells us "it was very hard to leave our beautiful hill and houses, especially since I did most of the actual building on them." His varied experience since graduating from

(Continued on page 16)

ALFRED CLAUSS

JANE WEST CLAUSS

NEXT MONTH

● Editorial emphasis in our March issue will be laid on an outstanding example of hospital planning for which the reference point is "mental and spiritual well-being of the patient," on the premise that this constitutes the most important factor in his return to health. Proposed Faith Hospital, St. Louis, Mo., is the work of Joseph Denis Murphy, Architect, and Angelo G. Corrubia, Associate. Their integration of design with the function of the building seems worth the study of any designer commissioned to do hospital work.

● The first exposition of an entirely new structural system—which makes *logical* use of removable walls and such familiar materials as metal tubing, die-stamped metal, connector pins—also will be featured. The presentation, to appear in the MATERIALS AND METHODS section, will report the success of an experimental design project developed for more than two years under supervision of the inventor of this system, Konrad Wachsmann, who is an architect, designer, also an official of the General Panel Corporation.

● An entire cooperative community of houses of contemporary design, near Philadelphia, will be the subject of a third presentation next month. The story of Bryn Gweled, Feasterville, Pa., its basic planning and use of the land, constitutes research of the first order. We find it especially interesting that a number of architects have had a hand in the development of the village to date. Others may look and learn.

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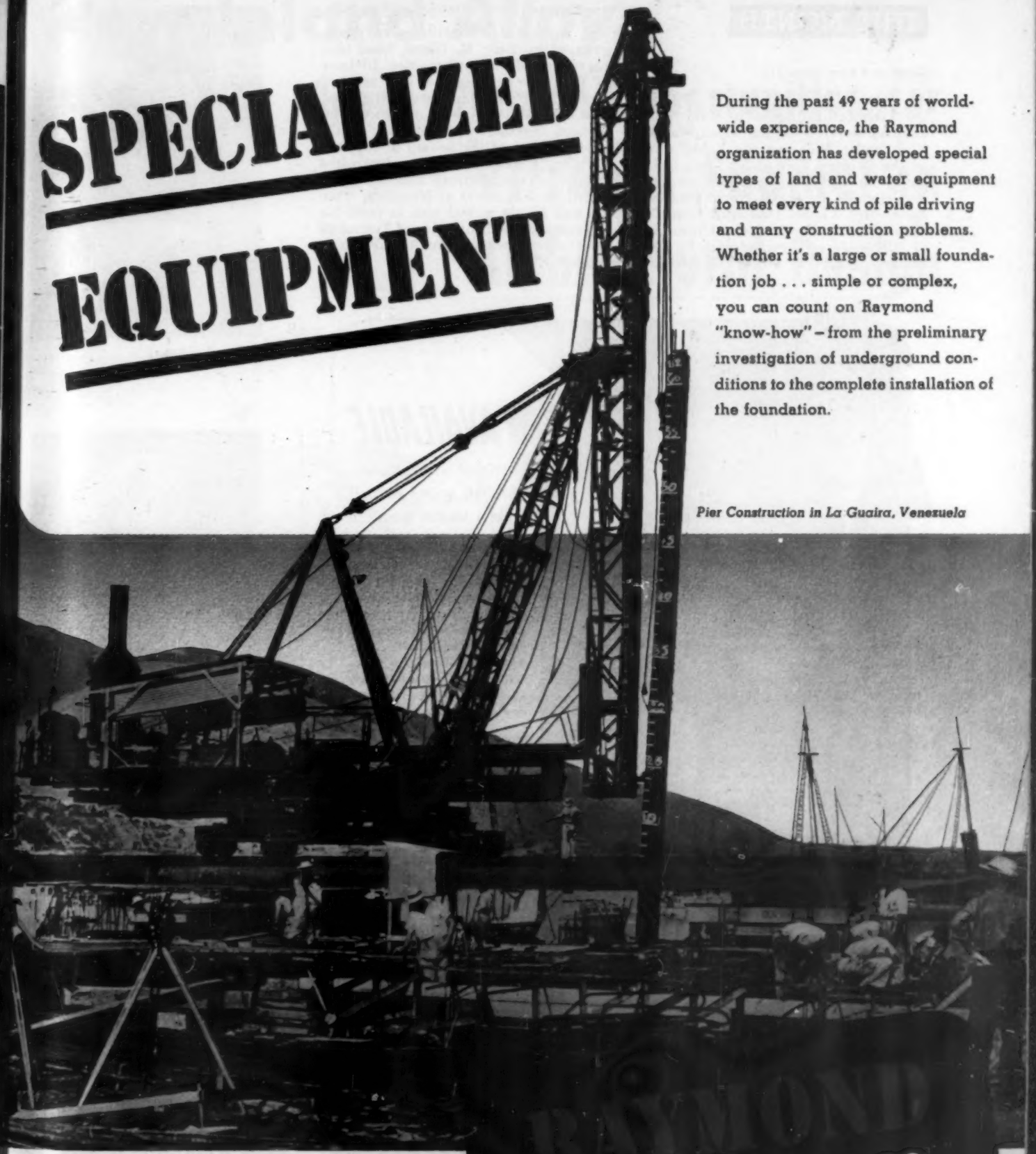

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THIS MONTH

(Continued from page 11)

the Architectural School in Munich has included work on the Barcelona World's Fair, under Mies van der Rohe; work on the Chicago Fair under Louis Skidmore; work with Howe & Lescaze; and participation in architectural competitions. Mrs. Clauss graduated from the architectural school of the University of Minnesota and worked with Le Corbusier in 1931-32. Since 1934 she has collaborated with Clauss in Knoxville.

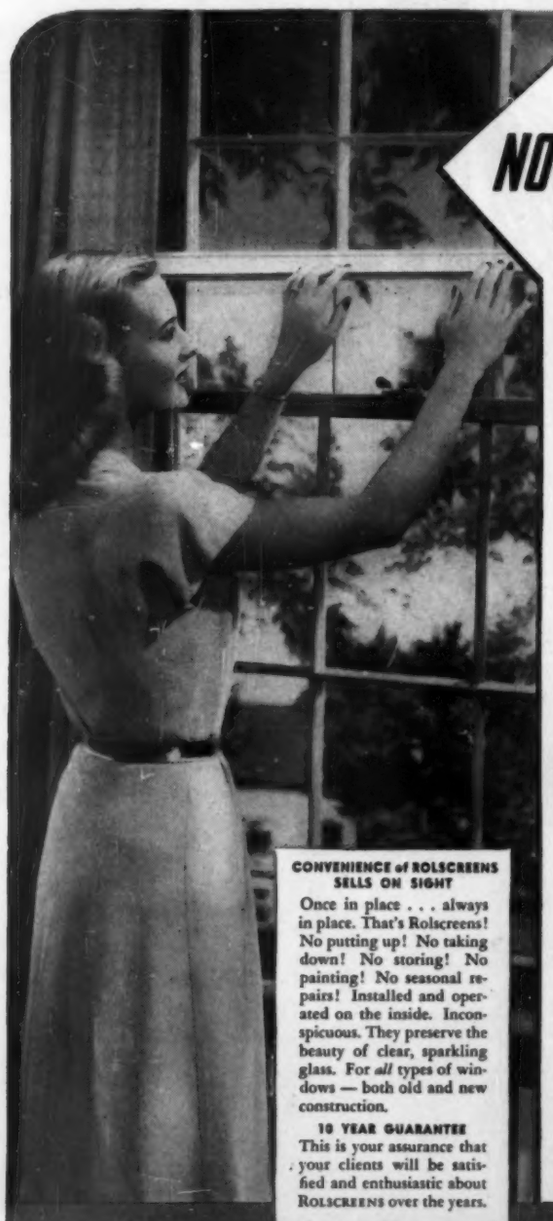
The houses at Knoxville were photographed by Billy M. Glenn, head photographer of the Information Division of TVA. He explains that they resulted from "my friendship with Mr. Clauss and a great interest in modern architecture, together with the fact that I now own one of the houses in the subdivision." He first became interested in photography during summer work for U. S. Engineers at Memphis, when he was 17. It helped him to meet his expenses at the University of Tennessee and he now prefers architectural photography.

BILLY M. GLENN

ISADORE ROSENFIELD

The professional life of Isadore Rose
field, whose **Daylighting for Hospita**
page 87, is concluded in this issue (s
also PROGRESSIVE ARCHITECTURE, D
cember 1945) has been virtually de
cated to hospitals and related planni
After attending Harvard, where he r
ceived his architectural degrees, h
studied and worked with three of o
acknowledged hospital planning exper
—Edward F. Stevens, Thomas B. Ki
ner, and Dr. S. S. Goldwater. In h
24 years of professional activity he h
designed or directed the design of mo
hospitals than can be credited to a
other American architect. Prior to e
tering private practice last fall, Rose
field was chief architect in the Depar
ment of Public Works, New Yor
where he had charge of the city's pos
war hospital planning program, tota
ing more than one hundred million do
lars. He also has contributed much t
hospital literature and has been activ
as a lecturer on hospital planning an
as a teacher.

(Continued on page 18)



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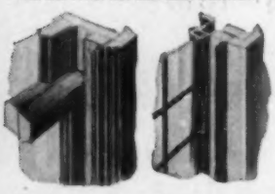

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THIS MONTH

H. P. MOREHOUSE

Data for Types of and Locations for Gas-Fired Heating Units, page 92, came to us from H. Preston Morehouse, for many years an engineer with Public Service Corporation of New Jersey and now their representative for Heating and Air Conditioning. He also is chairman of the Committee on Housing, American Gas Association; member of the Joint Committee on Air Conditioning, A.G.A.; and past chairman of the A.G.A. subcommittee on Publicity and Specifications.

Proclaiming Home Building as "America's No. 1 Project for 1946," the National Association of Home Builders has called a convention, February 25-28, in Chicago. Headquarters will be at the Stevens Hotel.

Spokesmen for government, the construction industry, and realty interests have been invited to address the convention and participate in a series of panel discussions scheduled to attract thousands of builders and planners from all parts of the country.

Announcement of awards in the recent competition for selection of an architect for new dormitories at Smith College, Northampton, Mass., reveals that the winners are Norman and Jean Bodman Fletcher, associated with Benjamin Thompson. The Fletchers also won the PENCIL POINTS—Pittsburgh competition last year for a "House for Cheerful Living."

The dormitory competition was jointly sponsored by the Museum of Modern Art and PENCIL POINTS—PROGRESSIVE ARCHITECTURE and the winning designs are to be presented in our April issue. Richard M. Bennett, Yale University, was the professional adviser.

Winners of the cash prizes were: Sarah Harkness and John C. Harkness, Milton, Mass., second prize of $1,000; Roy S. Johnson, Julius Stein, F. Ginsbern, New York, N. Y., third prize of $500.

Awarded honorable mention were: Marcel Breuer, Cambridge, Mass.; Sigurd Ellison, Brooklyn, N. Y.; Richard Filipowski, Chicago, Ill.; Percival Goodman, New York, N. Y.; Robert W. Kennedy and Robert A. Irigoyen, Cambridge, Mass.; Carl Koch and Alfred Parker, St. Simon Island, Ga.; Robert A. Little, Cleveland, O.; I. M. Pei, Cambridge, Mass. (*two mentions*); S/Sgt. John N. Sill, Pittsburgh, Pa.

Winners of the $1,000 prizes in the recent Chicagoland Prize Homes competition sponsored by the Chicago Tribune, which will publish all the winning designs starting Sunday, February 3, included one woman designer and 11 service men or veterans.

The competition called for solutions to three specific houses of varying sizes, with eight prizes in each group. The prizewinners were:

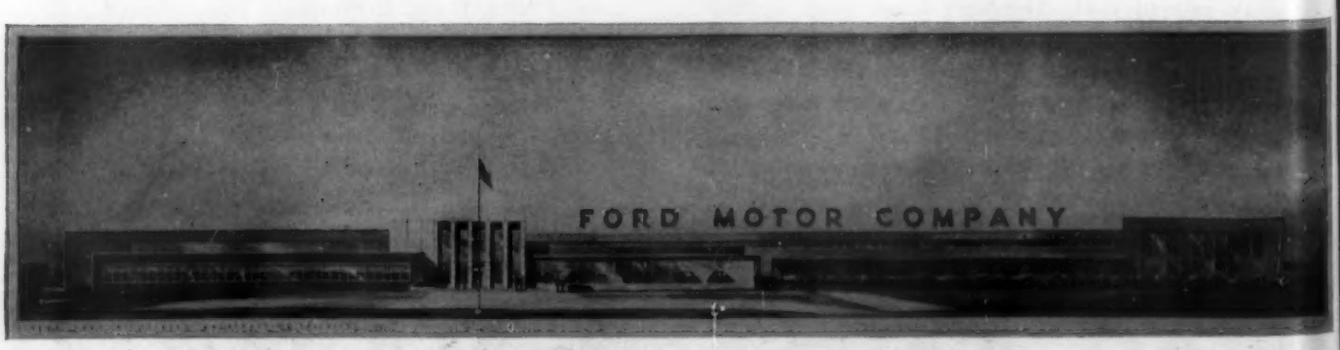
Edward L. Burch, Jr., Evanston, Ill.; Lt. (j.g.) W. R. Burns, Jr., Harrisburg, Pa.; Carl L. Cederstrand, Wilmette, Ill.; Merwin H. Freeman, Los Angeles, Calif.; Raymond W. Garbe, Wheaton, Ill.; Edward H. Glidden, Jr., and Eben D. Finney, Baltimore, Md.; Joseph C. Gora, Boston, Mass.; Edward W. Hanson, Stillwater, Minn.; Herbert C. Hanson, Chicago, Ill.; and Henry Martorano, Chicago, Ill.; Heidt Associates, Orange, Tex.; George R. Klinkhardt, Berkeley, Calif.; Mrs. Lucile McKirahan, Stuttgart, Ark.; Arthur R. Myhrum, River Forest, Ill.; Ensign Ralph DeLos Peterson, Jr., Gary, Ind.; Lt. Custis S. Woolford, Jr., South Orange, N. J.; Capt. Arthur Jack Sackville-West, Colorado Springs, Colo.; Charles W. Schroeder, Chicago, Ill.; Frederick E. Sloan, Golf, Ill.; Lt. Ray Stuermer, Chicago, Ill. (*two awards*); D. Coder Taylor, Evanston, Ill.; Walter J. Thies, Dayton, Ohio; Howard J. Uebelhack, Wilmette, Ill.; Erick Wenstrand, Chicago, Ill.; and J. Floyd Yewell, New York, N. Y.

The National Public Housing Conference announces that its annual session will be held March 14-16 at the Hotel New Yorker, New York. Details of the program or arrangements may be obtained from Lee F. Johnson, N.P.H.C. executive vice president, 1015 Fifteenth St., N.W., Washington 5, D. C.

GEORGE HERBERT GRAY
1874-1945

Maj. George Herbert Gray, New Haven architect and active proponent of city and state planning, died in November at his home in Hamden, Conn. He was a life member and fellow of the A.I.A.; a former regional director and a past president of the Connecticut Chapter; and a member of various planning and housing groups.

A graduate of Johns Hopkins University and pupil of ateliers in New York and Paris, Major Gray worked in New York and Louisville offices prior to World War I. After service in France with the U. S. Corps of Engineers, he went to New Haven and resumed his architectural practice. In addition to his professional and civic activities, he was author of articles on housing and planning. Shortly before his death he had completed a book, *Housing and Citizenship*, to be published in the spring by Reinhold Publishing Corp.



DESIGN FOR A NEW FORD MOTOR COMPANY ASSEMBLY PLANT at St. Louis, Mo., in the vicinity of the municipal airport and adjacent to rail freight facilities, has just come from the boards of Albert Kahn Associated Architects & Engineers, Inc. Joined to the plant building is an office building that features a display room combined with an imposing entrance lobby. There are also to be a separate power house, related service structures, and a test track. The second-story unit across the main building is exclusively for employee facilities.

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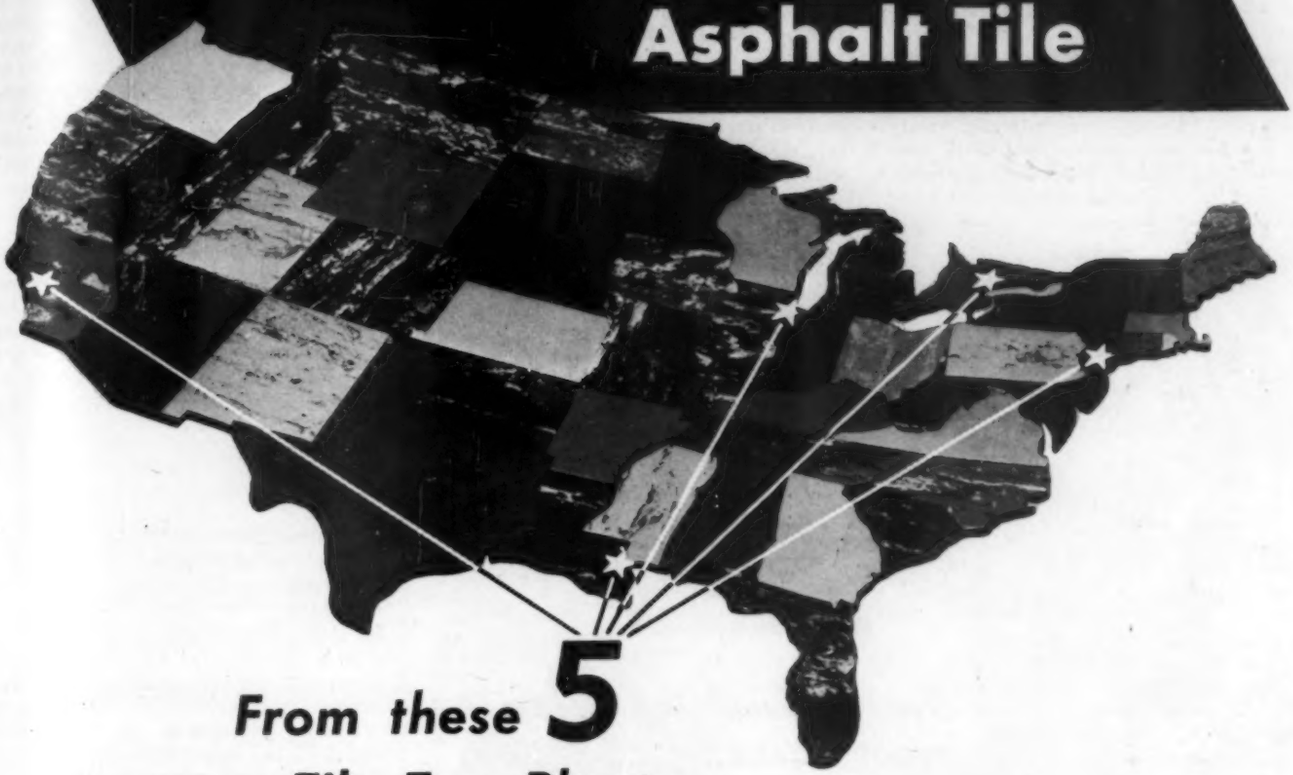

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ARCHITECTURAL DRAFTSMEN, large department store chain. Can use men with either general architectural training and experience or retail store fixture layout experience. Complete building construction and alteration plans. Permanent with chance for advancement. Location New York. 5-day week. Apply Personnel Dept., J. C. Penney, 330 W. 34th St., New York City.

SEVERAL ARCHITECTURAL DRAFTSMEN thoroughly experienced, able to prepare preliminaries, working drawings, etc., familiar all phases architectural drafting. Must think, draw, along modern trend. Work on postwar theaters and diversified projects. Excellent opportunity for permanent position. Write education, experience, salary, to M. J. DeAngelis, R.A., 1404-1405 Temple Bldg., Rochester 4, N. Y.

ARCHITECTURAL DRAFTSMAN needed for department store planning work. Must be familiar with fixture and interior designing. The Dayton Co., 700 Nicollet Ave., Minneapolis 2, Minn.

DESIGNER, capable of creating and executing architectural interiors and exteriors, specializing in restaurants, night clubs, department stores. Excellent salary and advancement for creative and capable man. S. W. Manheim Co., 3614 Euclid Ave., Cleveland 15, Ohio.

CLEVER YOUNG MAN, capable of doing perspectives and drawing plans mostly for homes and apartments. Opportunity to become junior associate or partner. Southeast Florida. Box 215, PROGRESSIVE ARCHITECTURE.

COMPETENT ARCHITECT wanted by national organization to draft uniform plans for buildings in various locations, to supervise construction, and to check plans submitted by other architects. State full qualifications and experience when applying. Box 225, PROGRESSIVE ARCHITECTURE.

ARCHITECTS OR ARCHITECTURAL DRAFTSMEN, DESIGNERS, wanted immediately for permanent positions in Palm Beach. Some experience in hotel and apartment house planning desirable but not essential. Give experience, previous employment, qualifications, and enclose photograph in first letter. Box 226, PROGRESSIVE ARCHITECTURE.

TWO ARCHITECTURAL DRAFTSMEN, capable of producing complete working drawings, with knowledge of commercial and industrial work. Salary according to ability to produce. Mid-

(Continued on page 22)

For Fast, Economical Industrial Construction

Specify... CEMESTO

REG. U. S. PAT. OFF.

Roof Deck: Cemesto panels 1-9/16" thick, applied with edges centering over steel headers and purlins and fastened to framing with metal clips.

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This Multiple-Function Building Material Offers *5 Major Advantages!*

More and more architects are turning to Cemesto when the problem is one of modern, high-speed, economical construction. This Mineral Tile Plant at Lagro, Indiana, is a typical example.

The architect specified Cemesto for both roof deck and exterior walls. Thus, in one application, Cemesto—which is made of Celotex cane fibre insulation board sheathed on both sides with asbestos cement, bonded with moisture-proof bituminous asphalt adhesive—gives *all five* of these major advantages:

1. Speed and economy of application!
The Cemesto wall unit incorporates in *one* material both structural wall *and* insulation. It can be pre-cut to needed sizes . . . used either vertically or horizontally.

2. Structural value!
Cemesto meets normal load requirements. It is rigid and permanent and saves on intermediate supporting members and materials.

3. Resistant surface!
The smooth, firm ⅛" asbestos-cement surface on both sides of the material is both fire- and moisture-resistant.

4. Self-finish interior surface!
The light gray Cemesto surface furnishes good light reflection value . . . plus a pleasing and durable finish that requires no painting.

5. Excellent insulating value!
Conductivity of the Celotex core has been established at 0.35 B.t.u. per hour per square foot per degree F. per inch of thickness.

Why not find out how *you* can take advantage of the versatility of Cemesto wall units? They are available in standard 4' wide panels, 4', 6', 8', 10' or 12' long, and in thicknesses of 1⅛", 1-9/16" and 2". Send today for files number 4500 and 44119 for details and descriptions of various applications of Cemesto to steel and wood. Write: *The Celotex Corporation, Dept. PA-246, Chicago 3, Illinois.*

CELOTEX
REG. U.S. PAT. OFF.
BUILDING PRODUCTS

THE CELOTEX CORPORATION • CHICAGO 3, ILLINOIS

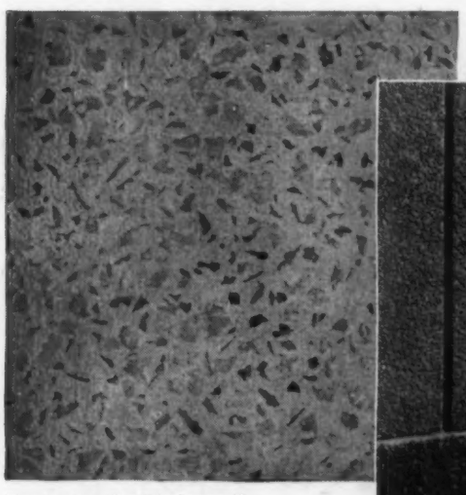
PREFABRICATION IN CONCRETE

ARCHITECTURAL CONCRETE SLABS ...color, pattern, texture to your specifications!

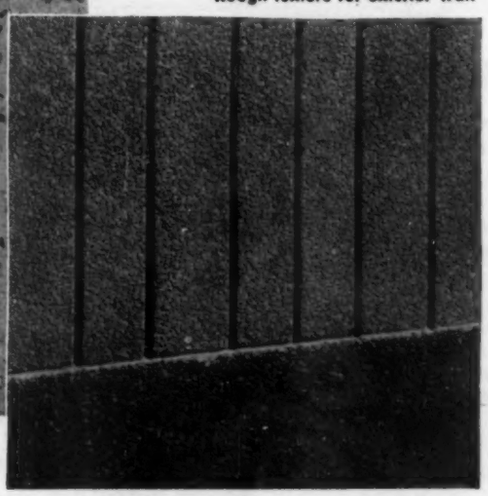
Architectural Concrete Slabs give the architect new freedom in design. These large pre-cast units ... with the strength and structural properties of *reinforced* concrete ... may be shaped to any desired profile. Their color, pattern, shape, size and texture may be varied at will ...

The face of the slab may be plain or patterned. Color and texture are obtained by exposing the aggregates — granite, quartz, ceramics or vitreous enamels. Thus the question of color becomes one of selection rather than of limitation.

To bring out the true color values of the aggregates, Atlas White Cement is used for the matrix. Whether the desired result is contrast or blend, it is the matrix that provides the essential overtones which give life to the color and texture.



Fine texture for interior wall



Rough texture for exterior wall

For further information see Sweet's Architectural File (4 B/2), or write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, New York.

PP-ACS-58

ATLAS WHITE CEMENT

For pre-cast ARCHITECTURAL CONCRETE SLABS

THIS MONTH

(Continued from page 20)

South firm of architects. Give complete information. Also INTERIOR STORE DESIGNER with knowledge of merchandising by Mid-South firm establishing a new department. Give full particulars. Splendid opportunity for responsible party. Box 228, PROGRESSIVE ARCHITECTURE.

INTERIOR DESIGNER wanted by large New York firm of industrial designers. Must be top-notch, modern, with wide contacts and experience. Architectural background, knowledge of construction materials, textiles, and design essential. Mature personality capable of handling large contracts and clients important. Salary high. Opportunity permanent. Box 229, PROGRESSIVE ARCHITECTURE.

SPECIFICATION WRITER, practical man with broad, general experience in building construction work (not mechanical), architect's office in Detroit. State qualifications and salary expected. Box 232, PROGRESSIVE ARCHITECTURE.

SITUATIONS WANTED

ARCHITECTURAL DESIGNER DRAFTSMAN, now a student at Cornell University, desires employment in small Eastern office after graduation this month. Has four and one-half years' drafting experience. 28 years old. Robert M. Fowler, Box 34, Freeville, N. Y.

REGISTERED ARCHITECT, 38, Yale graduate, awarded European Fellowship, desires contact leading to partnership with established progressive architect. 12 years' responsible experience handling various work encountered in designing and supervising large projects. Just released Naval duty, officer supervising ship construction. Can share financial responsibility. Edwin Wade, 5004 S. Belmont, Minneapolis, Minn.

ARCHITECTS-ENGINEERS. A Blueprint Co-operative Plant in your vicinity can produce blueprints at enormous savings. Man 40 years old, 20 years' blueprinting experience, will assume responsibility. Small investment by members voluntary, to assure patronage; otherwise, personal pledges sufficient. For further information write Box 202, PROGRESSIVE ARCHITECTURE.

ARCHITECTURAL DESIGNER, 25, with ability to sell and plan store fronts, fixture and lighting installations, and other commercial structure designs, desires permanent position preferably with large manufacturer, distributor of commercial structural products. Especially apt at creative drafting and scale perspective rendering. Detailed experience, samples, references available. Box 227, PROGRESSIVE ARCHITECTURE.

(Continued on page 24)

She'll love you for this!

BLUE RIBBON DESIGN
Regency Pattern
Cabinet Latch
No. 4220
Beautiful lines, gleaming chromium finish and jewel-like plastic thumbpiece in black or red – you've never seen cabinet hardware to match it. Used with Stanley exclusive self-fitting latch.
Size: 4⅛ in.
Matching Pull, No. 4420 Size: 3¾ in.

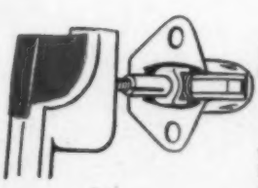
BLUE RIBBON DESIGN
Century Pattern
Cabinet Latch
No. 4223
Plain surfaces relieved with graceful curves add charm to this handle. Plastic thumbpiece in black or red simulates a jewel set in extra heavy chromium finish. Used with Stanley exclusive self-fitting latch.
Size: 3⅜ in.
Matching Pull, No. 4423 Size 3⅜ in.

The crowning touch of style-approved Cabinet Hardware by STANLEY!

This new line of Stanley Cabinet Hardware was styled by nationally noted industrial designers. Before they put a pencil to paper, these designers studied household cabinet hardware needs from A to Z. They considered functional efficiency as well as beauty. They designed ample finger room into latch pulls, pulls and knobs.

Added to the work of the designers were the results of years of research and test by the Stanley Engineering department. The result: a line of cabinet hardware that is smoother working, longer lasting and easier to install . . . and by all odds the most beautiful.

There is a style and finish to please every taste. There is a type and price to fit every budget. The moment you see it, you will realize that here, at last, is a line of cabinet hardware that will "click" with homemakers the moment *they* see it. Write for descriptive folder showing the complete line of Stanley Cabinet Hardware. The Stanley Works, Cabinet Hardware Division, New Britain, Conn.



New! Self-fitting latch–

Pat. Applied For
Unique new "trigger" latch has a friction sleeve which adapts itself automatically to doors from ¾-inch to 1⅛-inches thick. A Stanley "exclusive"!

New! Jewel-like Plastic Inserts–

Latch thumb-pieces molded of sparkling, durable plastics – red or black – give modern beauty to this hardware.

STANLEY
Trade Mark
Cabinet Hardware

PROGRESSIVE ARCHITECTURE

PENCIL POINTS

WE'RE BETTING ON TH

It is impossible for any thoughtful person to survey the world, or our c
country, or even our own profession, at the turn of this year and get fr
his observations any great feeling of satisfaction. Things look pretty h

In our own field—that of architecture and building—there are seve
serious situations. High prices, material shortages, strikes and the thr
of strikes, black market operations, and scarcities of specialized ma
facturing and building labor are holding up the actual execution
many projects that are otherwise ready to go ahead. The army dem
bilization policy (which might have been intelligently integrated w
the needs of the national economy, but was not) has been allowed
bog down, with the result that a lot of men badly needed in spec
civilian pursuits like architecture are being held in uniform while oth
are prematurely let loose into a civilian life that is not yet ready
absorb them. The acute housing shortage, which was foreseen by ma
architects and planners four or five years ago and should have be
provided against then, is now embarrassing many cities and causing
wild search for emergency expedients to relieve it. Surely there
trouble both here and ahead.

Yet we have enough confidence in the underlying common sense a
organizing ability of the American people and their leaders to make
believe that the difficulties will be straightened out without an unbe
able amount of dislocation and suffering. It won't be altogether an ea
process: there are no "snap" solutions to these problems. They w
require the patient, persistent efforts of men of good will to pull thin
together and counteract the disruptive forces that V-J Day set loose.

This magazine has often iterated its faith in the future and in the desti
of the professions entrusted with the planning of tomorrow's human e

UTURE!

RUSSO

THOMAS H. CREIGHTON Born Philadelphia, Pennsylvania, 1904. Education: public schools, Albany Academy, Harvard College, Beaux-Arts Institute of Design. Employed, after schooling, in several well known offices in various states as designer, project manager. Had own office for a time which was given up to become assistant senior architect, Department of Hospitals, New York City. Lately an associate in the firm of Alfred Hopkins and Associates. Registered architect, New York State, associate member American Hospital Association, member American Institute of Architects. Author of numerous magazine articles and book, "Planning to Build."

nment. We shall continue to serve to the limit of our ability the men onsible for the design of the better building and physical arrange- ts that an expanding society requires. We shall continue to look ward and to encourage the growth of progressive architectural design. e specifically, we shall undertake to provide our readers with an easing flow of timely, accurate, and reliable architectural and tech- l data, designed to keep them informed of significant developments he art and craft of building.

ne with this policy, we announce with pleasure and pride the addi- to our already energetic and able editorial staff of a new member brings us fresh strength, enthusiasm, and mature understanding of practical problems of the architectural world. He is Thomas H. ghton, A.I.A., who is already known to many of our readers through ings that have appeared in these pages and elsewhere. We have suaded him that the opportunity to serve the field of architecture ugh this magazine will in the years to come be in many ways a arding one. Since he firmly believes in the philosophies of design which we have dedicated ourselves, he has been willing to leave a cessful and potentially lucrative career in architectural practice to forces with us. He will act as Executive Editor and will undertake administrative responsibilities of the editorial department. We expect he will add substantially to our ability to serve this field and we come him as friend and associate.

Kenneth Reid

2 DORMITORIES FOR RAILROAD MEN

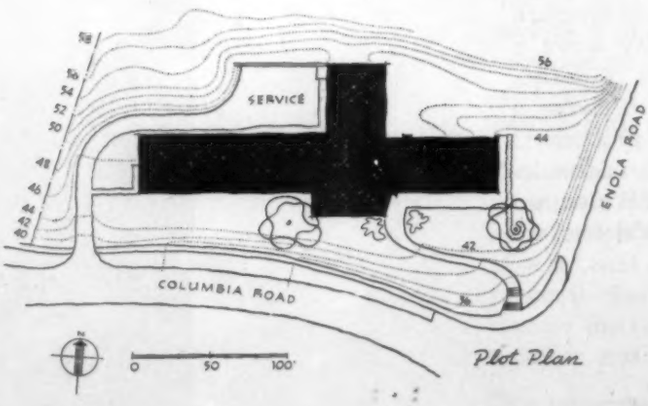
One of the most satisfying things about progressive architecture is the flexibility it has demonstrated time and again in finding design solutions for new human problems or ones for which only the most makeshift answers have heretofore been offered. In the dormitories presented here, built during the war for the Pennsylvania Railroad, we find not only a new answer to an old problem, but a new building type that reflects the intention of at least one important company to further its employer-employee relations. Not the least encouraging aspect of these buildings is the indication they give of numberless other human needs that await only the recognition of the problem by those in charge and the progressive designer's diagnosis.

Photographs by Robert Damora

MURPHY, QUIGLEY & CO., General Contractors
PETER STROBLE, Consulting Engineer
WOHLPART & HART, Mechanical Engineers

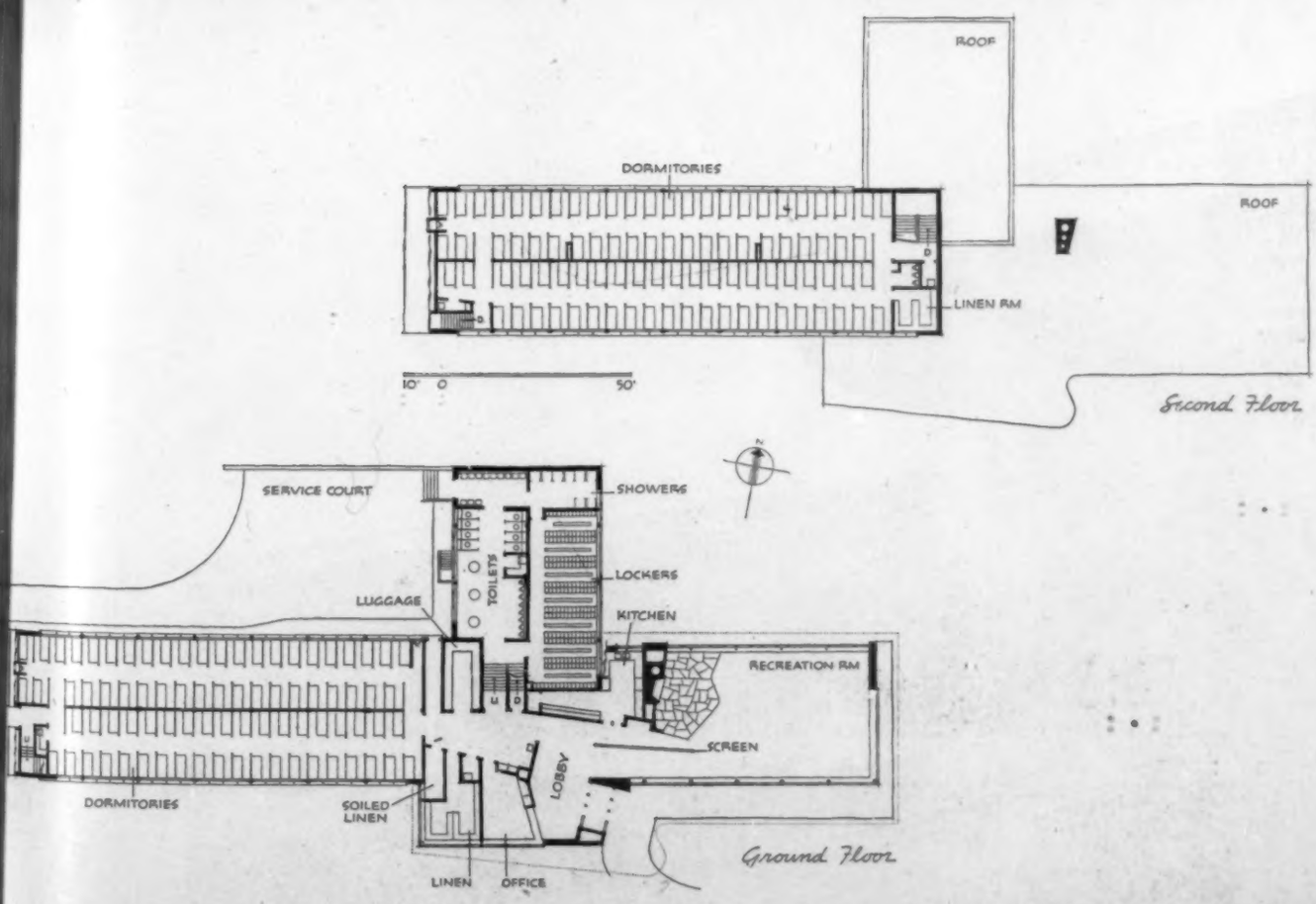
1 . . . DORMITORY AT ENOLA, PA.

LESTER C. TICHY, Architect



Plot Plan

The dormitory at Enola (like the one at Reily St., Harrisburg; see page 54) was designed and built to provide neat, quiet, comfortable sleeping accommodations and a lounge for railroad men who find themselves after a day's work at the end of a run many miles from home. Heretofore, the only available accommodations have been local rooming houses or casual provisions in railroad shop buildings. The Enola dormitory, with space for 169, is for the use of men who work on freight trains. In plan, the sleeping accommodations, recreation area, and sanitary conveniences are clearly defined.


ROOF
DORMITORIES
ROOF
LINEN RM
10' 0 50'
Second Floor
SERVICE COURT
SHOWERS
TOILETS
LOCKERS
LUGGAGE
KITCHEN
RECREATION RM
SCREEN
LOBBY
DORMITORIES
SOILED LINEN
LINEN
OFFICE
Ground Floor

1 . . . DORMITORY AT ENOLA

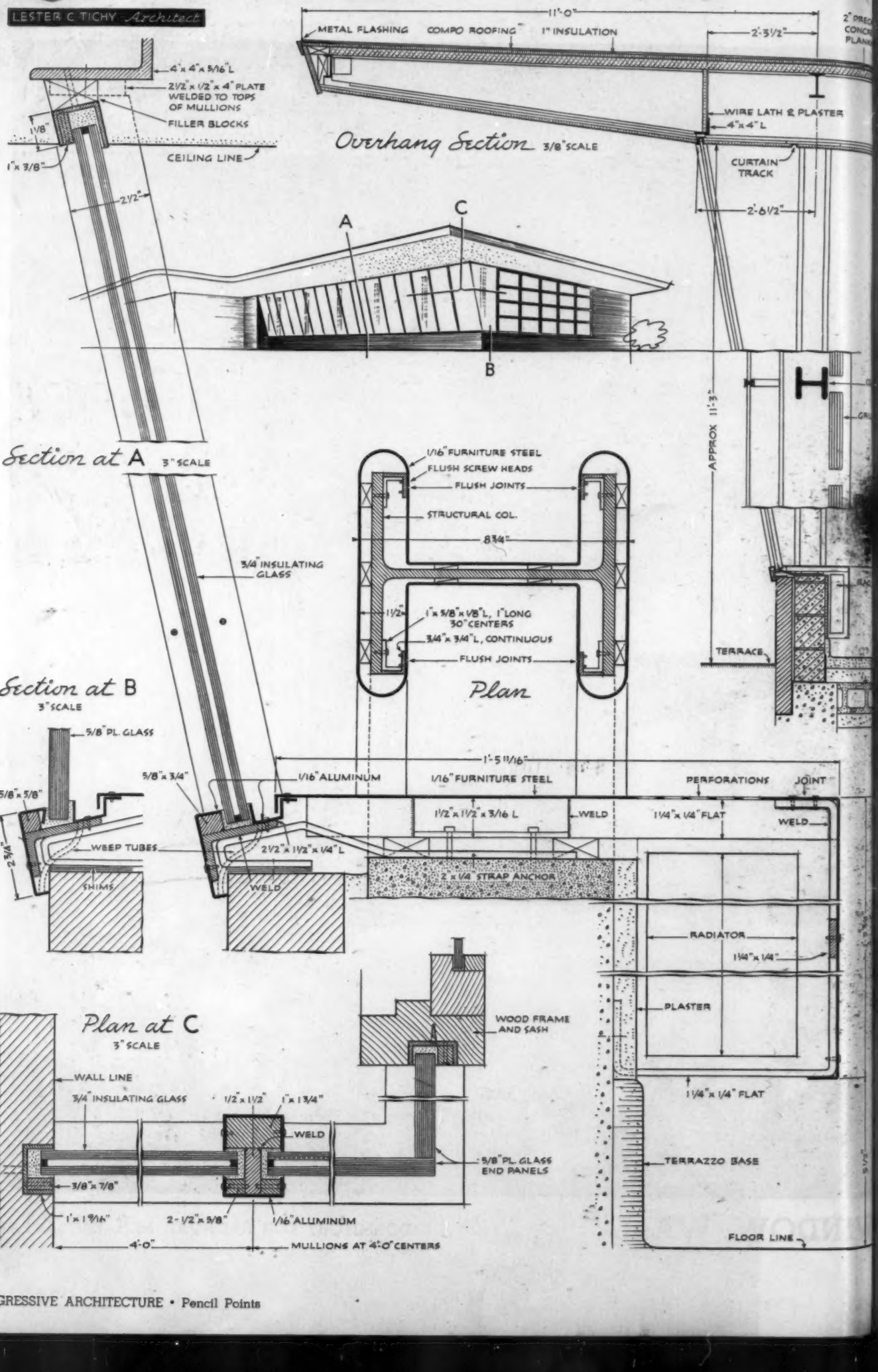
LESTER C. TICHY, Architect

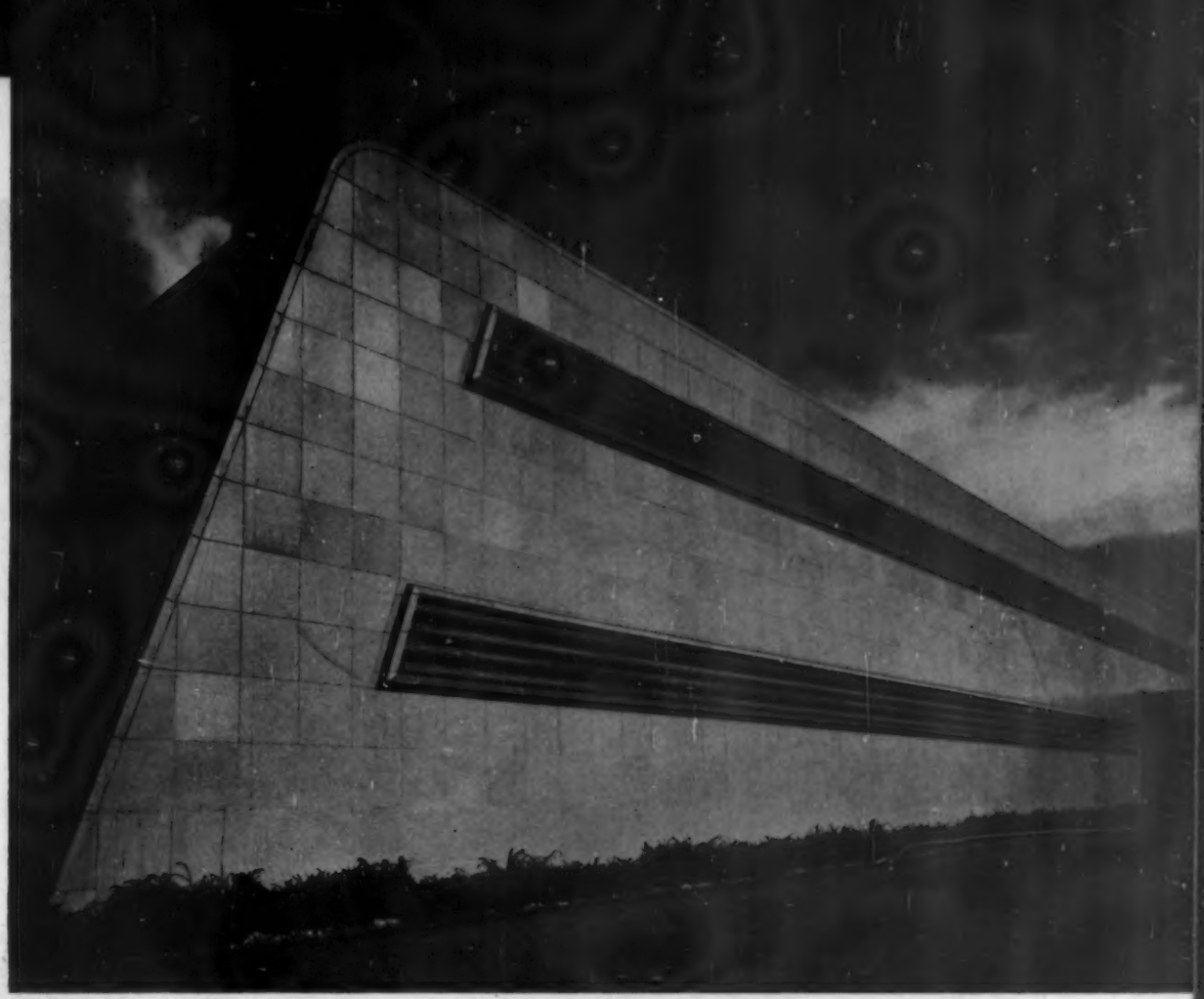
The outsloping wall of the lounge at Enola reflects the fact that the building is on a hilltop with a widespread view to the southwest. A guiding principle in the selection of materials—and, hence, a considerable factor in the character of the finished design—was that the building be able to stand hard wear. In general character, the wish was to provide an atmosphere that, while comfortable, should be sufficiently austere so that it would prompt the users to respect the property and keep it orderly. Selection of hard, permanent materials is the result, and there is a rather Spartan simplicity to the design that discourages a feet-on-the-table approach to life. That the buildings were built at all during the war is a tribute to the war work that the railroads handled; a Government priority placed the jobs in the essential class. Even so, the architect tells us, "the trials and tribulations in obtaining adequate materials were at times almost insurmountable."

WINDOW WALL

DORMITORY FOR RAILROAD MEN, ENOLA, PA.

LESTER C TICHY *Architect*





CONTINUOUS LOUVERS shield the window areas of the dormitory block.

. . . DORMITORY AT ENOLA

ESTER C. TICHY, Architect

Since train schedules require that the buildings be used at any time of the day or night, the dormitories had to be contrived so that even at midday they would be dimly lighted yet airy—a design problem that resulted in a wall section wherein the window and ventilating bands are shielded on the outside by continuous, light-obscuring louvers.

The slope of the site was put to use by placing the locker-and-washroom wing a half story above the first floor. Thus, these rooms serve both sleeping floors, and sizable economies were gained by the fact that the facilities did not have to be duplicated. Framed in steel, the building is finished on the outside with salmon-red brick (around the lounge area and washroom wing) and neutral green-blue terra cotta (on the dormitory mass). The sloping end wall of the latter is a design element that the architect introduced because he felt it looked better that way. On studying the plan facilities within this wall, there seems to be no functional reason for this device.

The building is heated by a coal-fired hot-water system, and natural ventilation is assisted by forced air recirculation.

THE WASHROOM WING (left) occurs halfway between main floor levels.

The lounge itself is purposely kept as simple as possible; no movable objects such as bric-a-brac or plug-in lamps are used; breakage is thus avoided, and maintenance enhanced. The floors are a cream-toned terrazzo with flagstone in front of the fireplace; red brick and a yellow-painted ceiling add color interest, and the dark Bubingia wood veneer on the screen and around the fireplace provides a degree of texture and warmth to the scheme. The lounge chairs are upholstered in red and green leather. A kitchen, equipped with refrigerator storage space, allows the men to prepare short-order meals for themselves. The railroad supplies silver, china, and glassware.

THE FIREPLACE CORNER.

. . . DORMITORY AT ENOLA

STER C. TICHY, Architect

TYPICAL DORMITORY SPACE—metal partitions, asphalt tile floors, plaster walls and ceiling.

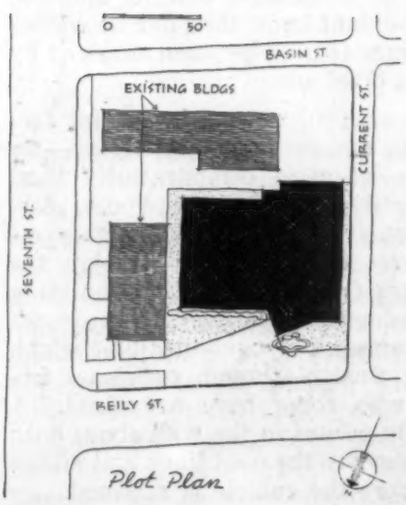
WASHROOM DETAIL.

The usual use-routine is for a man to come to the dormitory, deposit 25 cents for a locker key (returned on leaving), be assigned a cubicle, undress, wash, and let the attendant know the hour he wishes to be called. The lounge is used between times or by men who have just a brief stopover.

In the design of the sleeping rooms, important factors were permanence and ease of maintenance—resulting, again, in selection of comparatively hard materials—metal partitions, asphalt tile floors, plaster walls and ceilings. The problem of quiet is one that more or less solves itself, however. In plan, the dormitory is separated from the rest of the building by a row of service rooms and pairs of doors; in addition, lighting in the rooms is a subdued blue which suggests quiet, and finally—though not least important—the men who come here are tired. A louvered reading light occurs in the wall above each bed. An attendant removes the used linen and makes up the bed fresh before the cubicle is reissued.

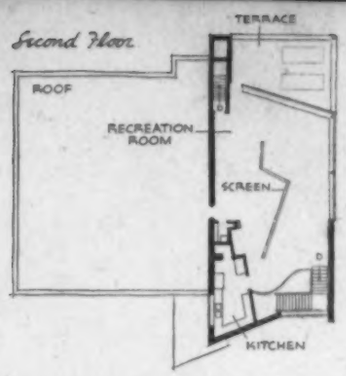
2 DORMITORIES FOR RAILROAD MEN

2 . . . DORMITORY AT REILY STREET, HARRISBURG

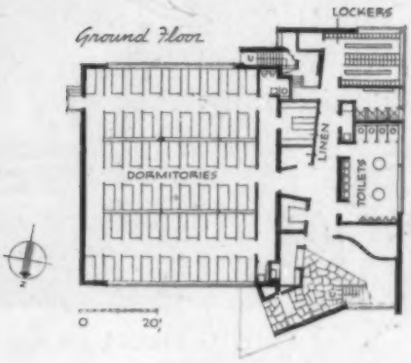


In the design of the Reily Street Dormitory, the basic problem was very similar to that presented at Enola—away-from-home sleeping quarters and recreation space for Pennsylvania Railroad workers. In detail, however, there are several differences. The site at Reily Street is a crowded in-town lot instead of an open hilltop, and, while the Enola dormitory is for freight-train crews, the Reily Street building is for passenger-train employees—conductors, brakemen, etc. Furthermore, the building is much smaller than that at Enola. Accommodations were needed here for only 50.

A study of the plans across page shows the same careful separation between the three major areas that maintains in the larger building—the dormitory room set apart from the public space by a passageway and a series of service and storage rooms, and the locker and washrooms related to yet distinct from both of these. Site limitations required a two-story scheme, and the lounge is located on the upper level.



THE SLOPE OF THE GLASS WALL of the second-story lounge makes it face due south.

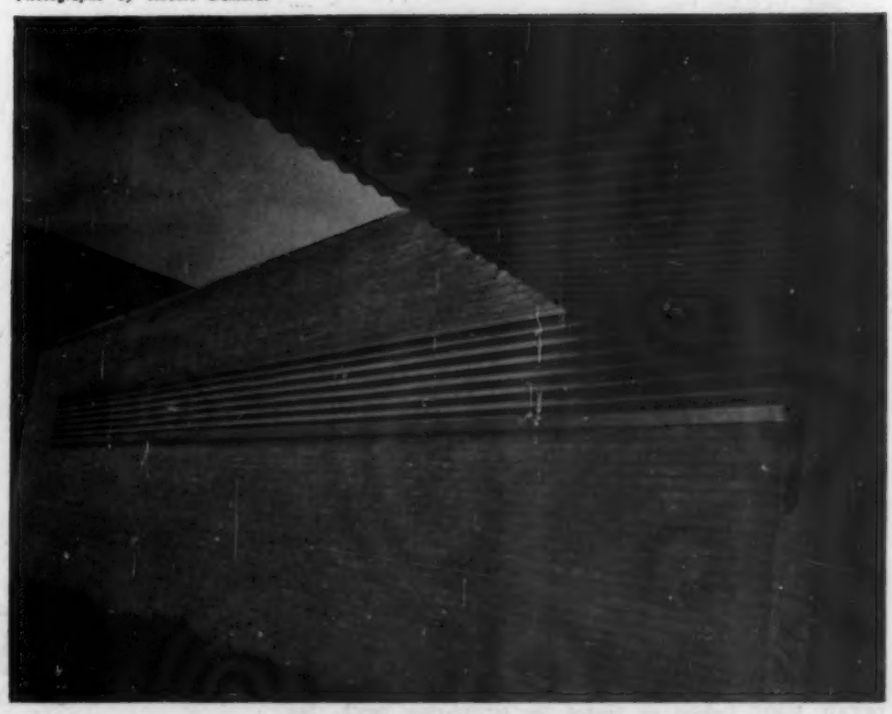


ON THE FIRST FLOOR, the entrance hall, a row of service rooms, and a passage hall separate the dormitory from the rest of the building.

Photographs by Robert Damora.

TER C. TICHY, Architect

PHY, QUIGLEY & CO., General Contractors
R STROBLE, Consulting Engineer
LPART & HART, Mechanical Engineers



A CONTINUOUS LOUVER outside the dormitory is both a light baffle and a ventilating device.

ENTRANCE DOORS, with dormitory wing at left and tall stair-hall window at right.

DETAIL SHOT looking up toward the second-story porch. See selected detail (page 62) of the porch railing.

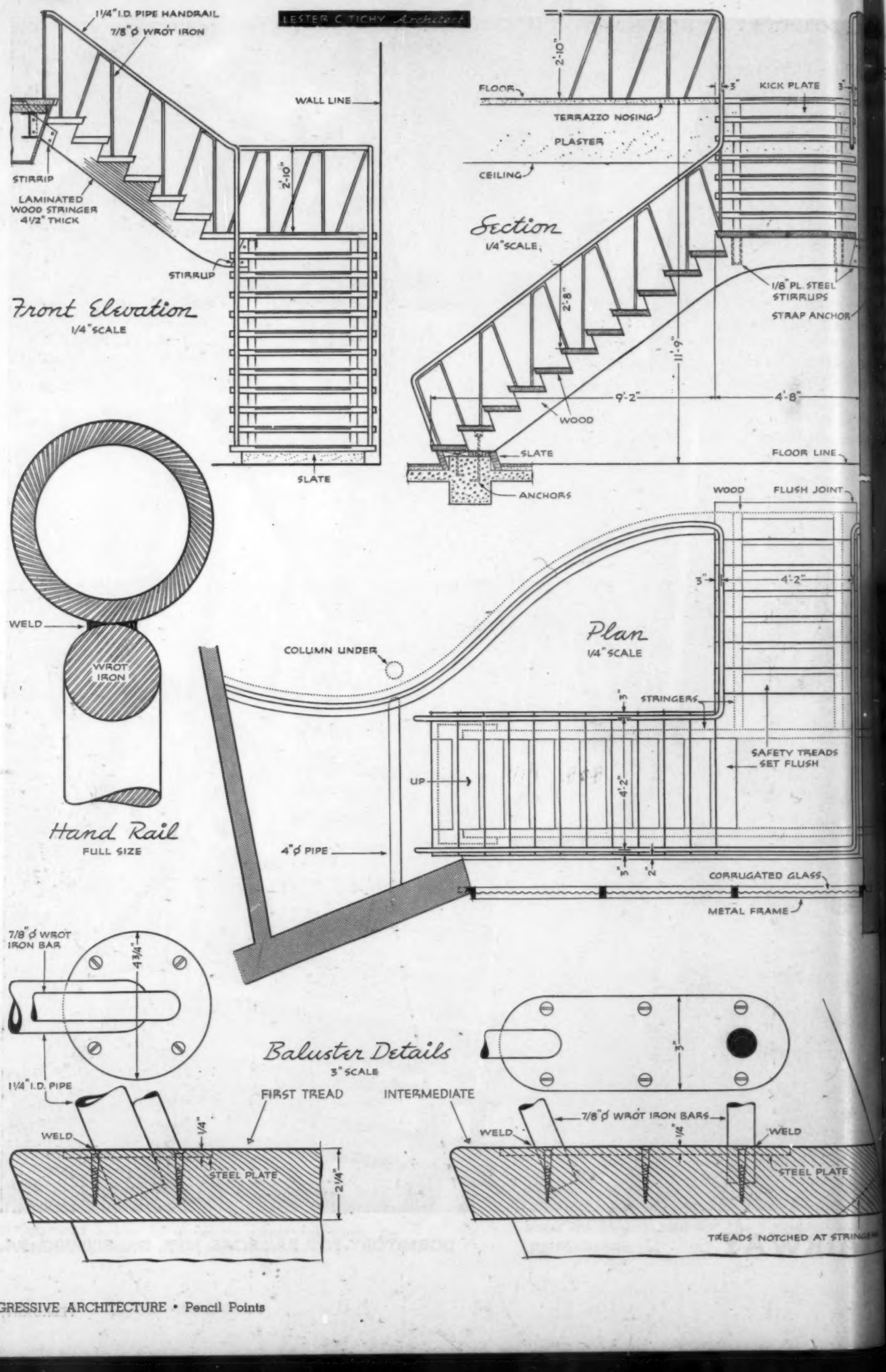
2 . . . DORMITORY AT HARRISBURG

LESTER C. TICHY, Architect

The tempered-glass entrance doors to th building are arranged at an angle to face th usual path of approach. Both of the dorm tories are so located that they are but a fe minutes' walk from the place where the me leave their trains. The underside of the mar quee is surfaced with corrugated asbesto recalling the horizontal lines of the louve outside the dormitory windows. Construc tion is a combination of a light, structura steel system and masonry. Exterior walls ar of brick with terra cotta tile backup. Both inside and out, materials were chosen for their durability and for the simplest possible maintenance.

STAIRWAY

DORMITORY FOR RAILROAD MEN, HARRISBURG, PA.


LESTER C TICHY Architect
1¼" I.D. PIPE HANDRAIL
7/8" ø WROT IRON
WALL LINE
STIRRIP
LAMINATED WOOD STRINGER 4½" THICK
STIRRUP
2'-10"
SLATE
Front Elevation
1/4" SCALE
FLOOR
TERRAZZO NOSING
PLASTER
CEILING
KICK PLATE
3"
Section
1/4" SCALE
1/8" PL. STEEL STIRRUPS
STRAP ANCHOR
2'-8"
11'-9"
9'-2"
4'-8"
WOOD
SLATE
FLOOR LINE
ANCHORS
WELD
WROT IRON
Hand Rail
FULL SIZE
WOOD
FLUSH JOINT
4'-2"
COLUMN UNDER
Plan
1/4" SCALE
STRINGERS
SAFETY TREADS SET FLUSH
UP
4"ø PIPE
CORRUGATED GLASS
METAL FRAME
7/8" ø WROT IRON BAR
4¾"
1¼" I.D. PIPE
Baluster Details
3" SCALE
FIRST TREAD
INTERMEDIATE
WELD
¼"
STEEL PLATE
2¼"
7/8" ø WROT IRON BARS
TREADS NOTCHED AT STRINGERS

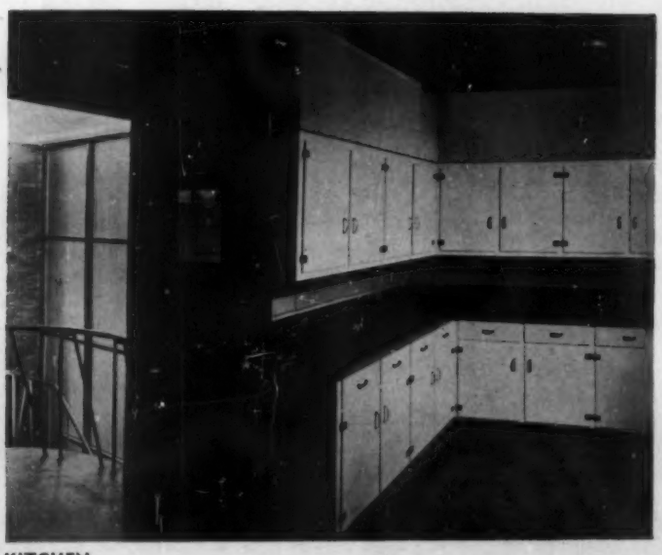
. . . DORMITORY AT HARRISBURG

STER C. TICHY, Architect

e big, full-height, corrugated-glass win-
w adjoining the stairway floodlights the
rance lobby, the stairs, and the upstairs
nge—the stair landing being also a bal-
y at the end of the lounge. Along the side
the building, the outlook is hardly pre-
ssessing, and the fenestration in this area
nsists simply of a series of single-light sash
ome hinged and in-opening) at ceiling
ight. Toward the sitting porch, the wall
the lounge is largely of glass, and good
ylight is admitted through two sizable rec-
ngular openings in the porch roof.

LOOKING DOWN TOWARD THE ENTRANCE from the stairway landing. The lobby floor is partly flagstone and partly terrazzo. The ceiling, as in all of the public space, is painted a soft yellow.

LOUNGE looking toward stair

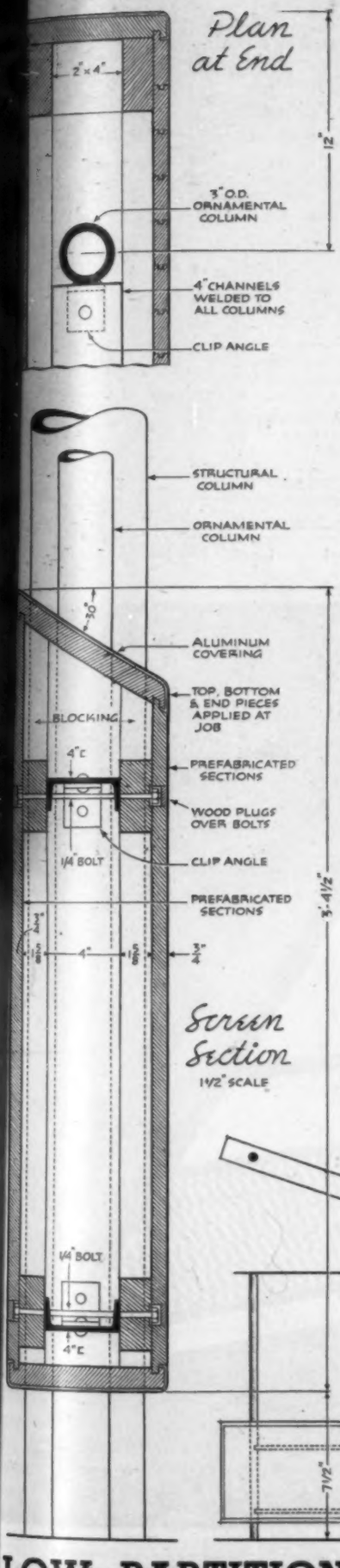


KITCHEN.

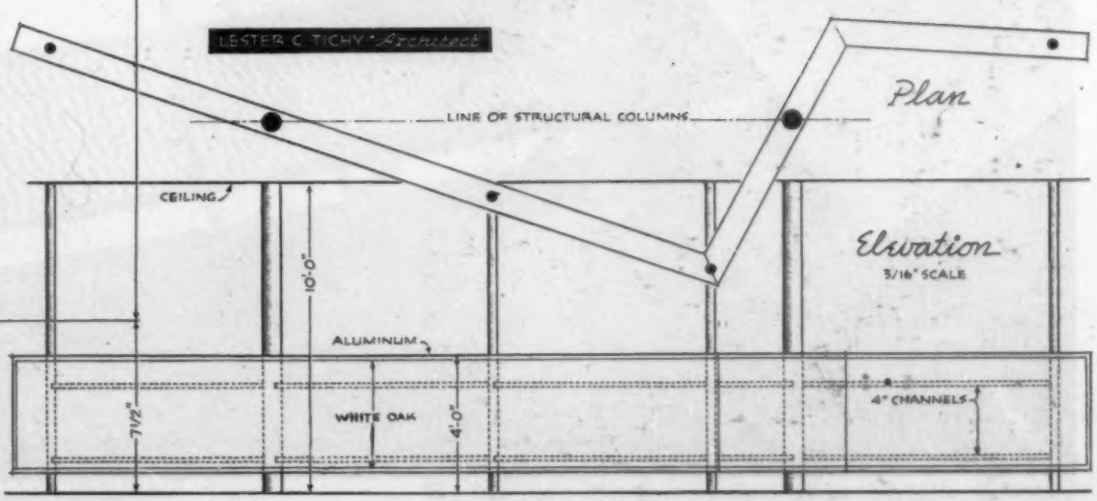
2 . . . DORMITORY AT HARRISBURG

LESTER C. TICHY, Architect

The lounge is subdivided by a low partition (see selected detail) into sitting and eating space. The top of the partition is sloped to keep it from being used as a seat. Adjoining the eating space is the kitchen, equipped with a refrigerator and storage lockers where the men may bring and check food supplies. As at Enola, the lounge is furnished with leather-upholstered lounging chairs, and the comparative severity of the permanent interior finishes is relieved by introduction of areas surfaced with wood veneer.



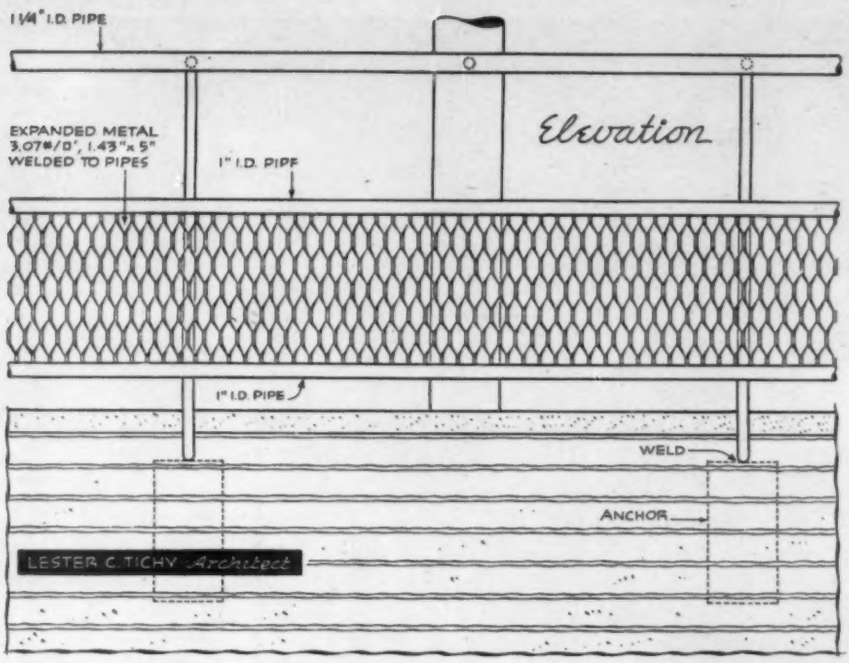
LESTER C. TICHY, Architect

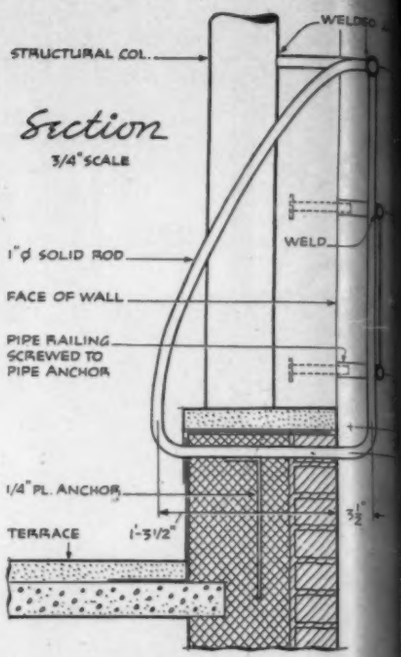


LOW PARTITION

DORMITORY FOR RAILROAD MEN, HARRISBURG, PA.

SELECTED DETAILS





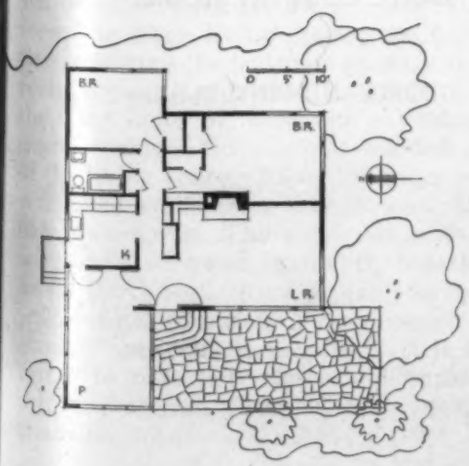
PORCH RAILING

DORMITORY FOR RAILROAD MEN, HARRISBURG, PA.

ra Stoller

SMALL COUNTRY HOUSE, ALPINE WOODS, N. Y.

GEORGE NEMENY, Architect



This house was built before the war, and the architect freely admits that compromises were made to gain certain mandatory appearances of tradition. In its basic planning, however, the approach is wholly of today. In addition, it achieves within a small area surprising flexibility and sense of space. Plan elements that contribute to this increased livability are the pair of "reverse swing" doors between porch and living room; the less-than-full-height storage partition separating living room from bedroom hall, and the big view window flanked by casements. A small basement occurs underneath the bathroom and the smaller of the bedrooms.

LIVING ROOM.

FIREPLACE. Partition wall at left.

SMALL COUNTRY HOUSE

GEORGE NEMENY, Architect

VING PORCH.

KITCHEN.

The doors between the living room and porch open to form one large living space; the 6-foot-high partition screening the bedroom passage makes the living room appear larger than its actual dimensions, and the long bank of windows extending around the corner includes the pleasant wooded outlook as part of the living space. All of the main rooms are cross ventilated southeast and southwest; the kitchen and bath face north. The porch opens to the south and west and is screened against the weather by windows on the north wall. Knotty pine was used for interior wall finishes to satisfy a requirement that the house should "not look too modern." It is interesting, we think, to note how the sound basic contemporary thinking shines through these incidental bows to tradition.

DEVELOPMENT RESTRICTED TO

LITTLE SWITZERLAND XVIII

DESIGNED BY ALFRED AND JANE WEST CLAUSS

For most families, we believe, a good house for today is one that makes living as pleasant and free from drudgery and costly upkeep demands as possible. In our opinion, the residential designer who sincerely strives toward these goals is working in a progressive, contemporary vein. Instances of the resultant houses frequently appear in these pages. Infrequently, however, is it our fortune to find and publish an entire development designed with this approach—particularly one promoted by real estate interests wherein a restriction required that all houses should be of contemporary design. On these next several pages we present just such an exception.

Located at the end of a high ridge of Brown's Mountain, six miles from Knoxville, this project of contemporary houses is a separate subdivision of a real estate development rather ambitiously called "Little Switzerland." It started with a group of congenial families who wished to build cooperatively and persuaded the designers to join in the venture. The latter prevailed on the realtor to make this portion of the ridge a separate unit and to establish the "contemporary design" restriction. In all, there are twenty 120′ x 240′ lots; to date, ten houses are either built or designed—all by Alfred and Jane West Clauss. Owners are assured permanent protection by clauses in the property deeds; houses must cost a minimum of $5,000; staggering of houses is required to insure a view and privacy for each, and a 15-foot setback from the access road is mandatory. The road runs level along the top of the ridge, and the land slopes sharply at either side. It is of more than passing interest to learn from the designers that "the project was favored by FHA and the bank for a higher loan valuation than they would give to isolated houses of modern design."

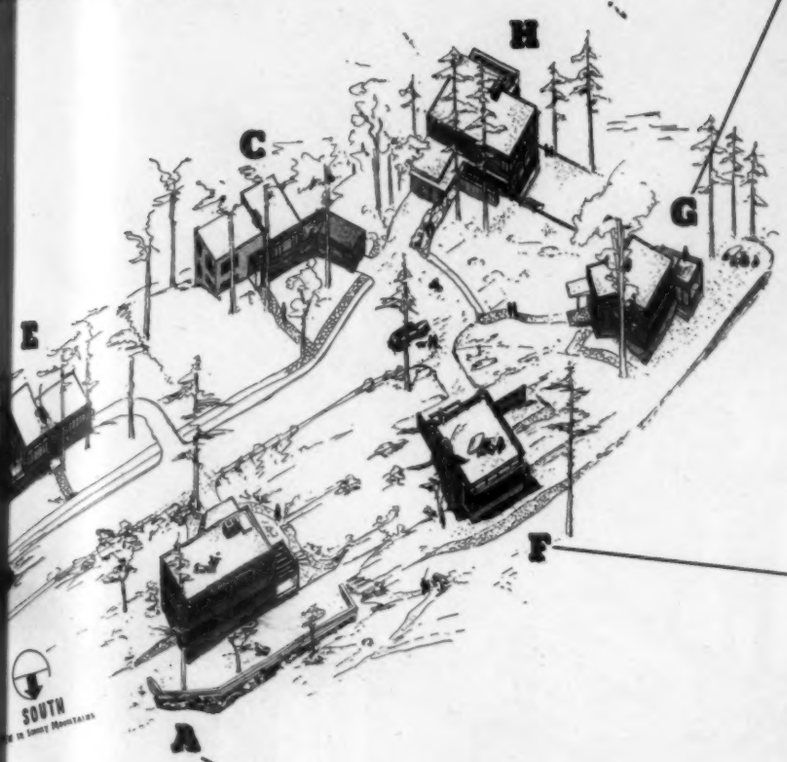
HOUSE B

HOUSE J

OUSES OF CONTEMPORARY DESIGN

XVILLE, TENNESSEE

ANE WEST CLAUSS

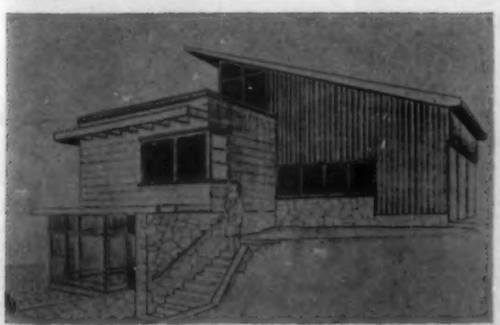


HOUSE G

Photographs by Billy M. Glenn

HOUSE F

HOUSE I

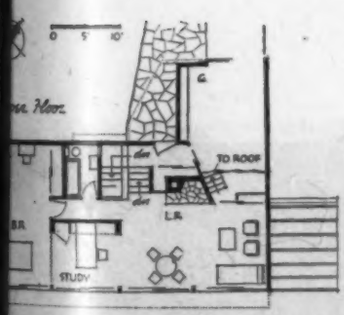


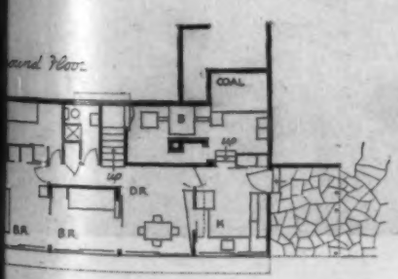
HOUSE A

HOUSE A

TLE SWITZERLAND

FRED and JANE WEST CLAUSS





One of the most recent units of the group, this redwood house, the designers' own home, represents a culmination and refinement of planning theories and details introduced in the houses previously built (namely, B, C, D, E, and F). The living room is placed on the second floor; the kitchen and dining room are on the ground floor, and the entrance door occurs at an intermediate level. This basic scheme, an intelligent design reflection of the sloping site, also separates living activities and provides desired privacy. Sleeping space and a bathroom also occur on each level—for the same reasons.

To suit the owners' particular preferences, however, the plan of House A is considerably more open and flexible than those of the other houses at Little Switzerland. Separation between several of the rooms or use areas is accomplished by curtaining instead of partitions, and sliding panels and removable, full-height closets anticipate the probability that alternate floor arrangements may be desired in future.

The recreation deck above the garage is reached by a stair behind a sliding panel in the living room; the kitchen porch opens onto the walled terrace on the view side at ground level. The garage and workshop, planned as part of the house, are connected directly with the entrance hall. Placement of the house on the lot made an entrance drive unnecessary.

ENTRANCE DOOR.

HOUSE A

LITTLE SWITZERLAND

ALFRED and JANE WEST CLAUSS

An important aspect of the organization of the house is the relative barrier to view and distraction it offers on the approach side and the continuous large-scale fenestration that occurs toward the south and the commanding view of the Smoky Mountains. A highly rationalized scheme, it provides both intermediate post supports that allow subdivision of the area into several sizes of desirable room shapes and the advantages to be gained from use of solar heat in winter. For evidence of the latter, witness the designers' report: "Only three tons of coal are used per year." They admit, however, that some of this economy is attributable to the central location of the heater room and chimney. To shade the sun in summer, the outriggers above the window bands are fitted with removable asbestos panels which slide into grooves provided in the framework. "These provide better air circulation than a solid overhang," according to the designers.

STREET SIDE of house.

DAY.

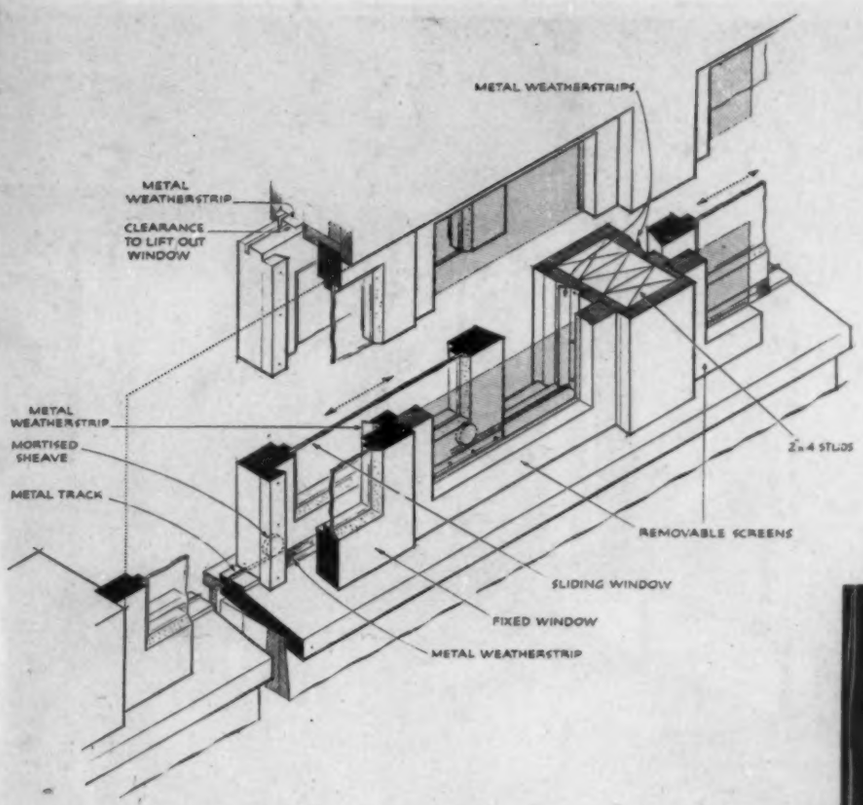
NIGHT.

HOUSE A

LITTLE SWITZERLAND
ALFRED and JANE WEST CLAUSS

The entire house was built by Mr. Clauss with the help of one local man! Foundation walls below grade are of poured concrete; above grade, native stone is used, the same stone from which the fireplace and chimney are built. Wood framing is covered with wood sheathing and roofing paper and finished with redwood siding. Interior walls are of gumwood plywood; ceilings are plaster over gypsum lath; and finished floors are oak. Both walls and roof contain a layer of mineral-wool insulation.

The sliding windows are a development of the one the designers used in the first house built in the de velopment—House F, the log-cabin minimum house shown on Page 78. The dining-room photograph over page is particularly effective in showing how ample these invite the superb view. In summer time, the sliding device permits extreme openness or a variety of placements of the sash to lure the breeze. Indirect light panels are used to illuminate the living room and hall.



DETAIL of sliding windows

FROM BEDROOM though drafting room area to living room.

LOOKING TOWARD the drafting room.

DINING ROOM.

KITCHEN.

HOUSE A

LITTLE SWITZERLAND

ALFRED and JANE WEST CLAUSS

A study of the photographs on these tw pages reveals the exceptional considera tion that the designers gave to storag problems, step-saving devices, and pro visions to simplify housekeeping. Be tween the dining room and kitchen a large central panel slides back to facili tate meal serving. Underneath the coun ter of this pass window, on the dining room side, is storage space for dining table items. On the kitchen side, th counter can be used either as a work to

A COMMODIOUS BUILT-IN STORAGE CABINET supplements regular closet space in the master bedroom.

for food preparation or as a sit-up eating place for quick, informal meals. Use of sliding doors on all storage units saves much floor space and helps keep the rooms neat in appearance. The master bedroom is equipped with a long, low built-in storage cabinet along the side wall in addition to an unusually large full-height closet. This generous provision of well located built-in elements greatly simplifies furnishing. Only a minimum of movable pieces is required.

THE UPSTAIRS BEDROOM.

HOUSE B

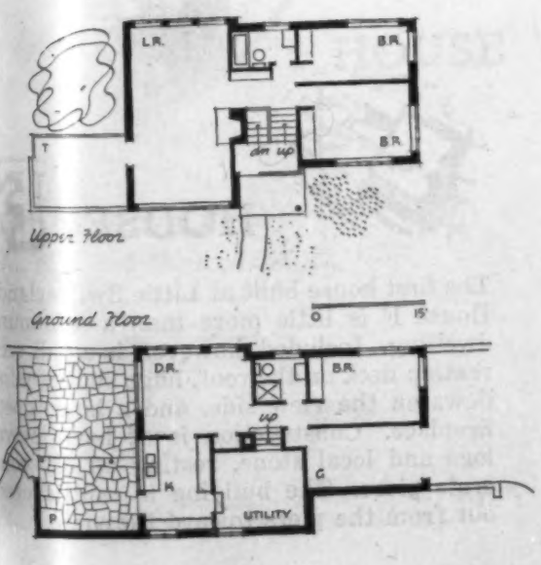
LITTLE SWITZERLAND

ALFRED and JANE WEST CLAUSS

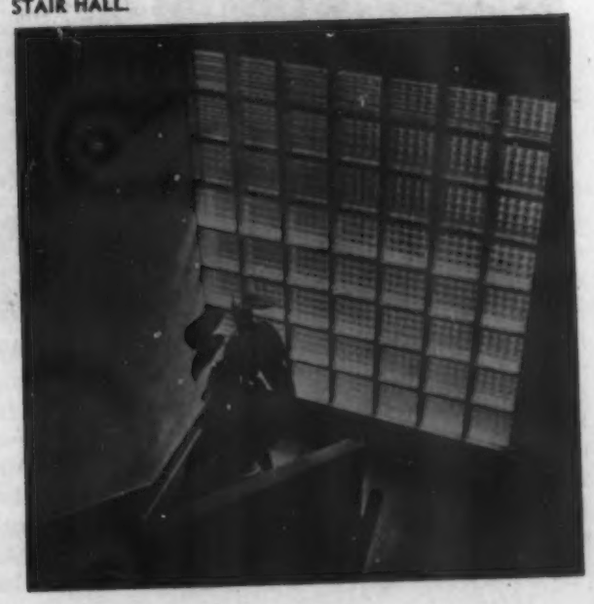
Among the first of the houses planned for the development, House B is one of a group along the north side of the access drive that have similar (or exactly in reverse) plans. It was in this group that the designers first experimented with the upstairs living room, the downstairs kitchen and dining room and the front door halfway between floors. To keep maintenance costs low, hollow tile (of a warm, sandy-earth color) is used for wall construction; the casements are steel; and interior surfaces are plastered.

LARGE WINDOWS of elevated living room at left.

LIVING ROOM.



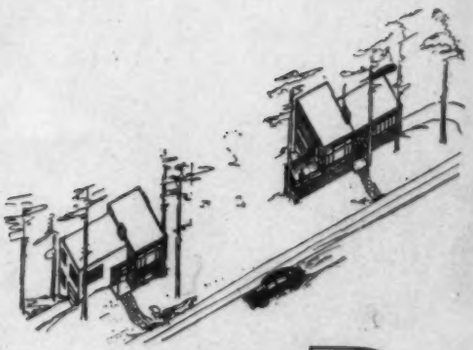
STAIR HALL.



TWO VIEWS of house C.

HOUSE C

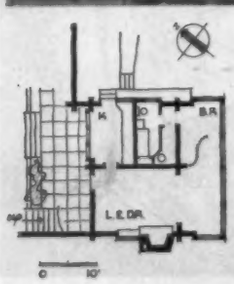
House C (photos at left) has almost
exact reverse of the plan of House B,
cept the slope of the site made a ga
wing, with roof terrace above, desir
Space occupied by the garage in Hous
is here given to a second bedroom.



HOUSES D AND E

Houses D and E are very similar, also
hollow tile construction, and are spac
along the north side of the drive so th
each has an uninterrupted view to th
mountains. E is yet to be built.

HOUSE F.



HOUSE F

The first house built at Little Switzerland
House F is little more than a minimum
dwelling. Included, however, is a full rec-
reation deck on the roof, huge sliding win-
dows on the view side, and a large open
fireplace. Construction is of hand hewn
logs and local stone, resting on six con-
crete piers. The building is cantilevered
out from the piers toward the view.

HOUSE G

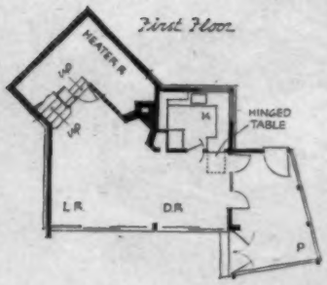
LITTLE SWITZERLAND

ALFRED and JANE WEST CLAUSS

This house, the most recent one completed at the development, was built during the war. Mr. Clauss did all of the work himself, with whatever materials were on hand or could be locally produced. Footings are concrete; foundation walls are of tile and insulated block; the wood framing was made from trees on the site, which were sawn into rough lumber at a nearby mill and dried on site. To conserve lumber for floors, gypsum roof planking was used for the roof and second floor; roofing is built-up gravel. The first floor is built of prefabricated 30″ x 30″ concrete panels which were laid over concrete joists, red smooth finished and waxed. Exterior walls are of asbestos shingles over insulation board.

HOUSE G

LITTLE SWITZERLAND
ALFRED and JANE WEST CLAUSS



In plan, House G is a departure from wh
appears to be the Little Switzerland "sta
ard." The entrance at the intermediate le
is used, but living room, dining room, a
kitchen are more conventionally arrang
all on the lower floor. All closet doors a
sliding, the large heater and storage room
reached directly from the living room, a
the chimney is centrally placed for econo
in heating. As with the other houses on t
southern slope, continuous window bands a
used for optimum daylighting and use of s
in winter. An angled porch with terra
above captures the ridge-end view in thr
directions.

SOUTHERN WALL.

FRONT DOOR.

SIDE.

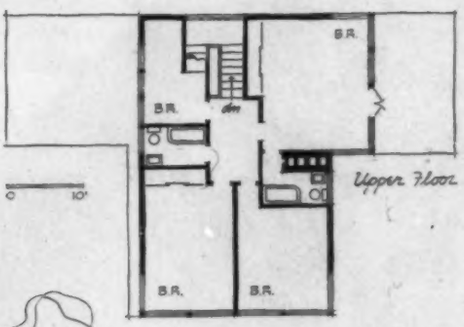
THE LIVING-DINING ROOM is 24 feet in length, with the whole south wall lined with windows. Wall surfaces are native stone or gumwood plywood.

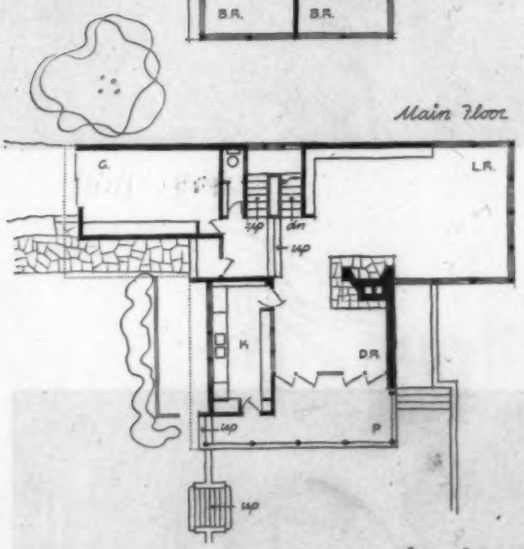
HOUSE H

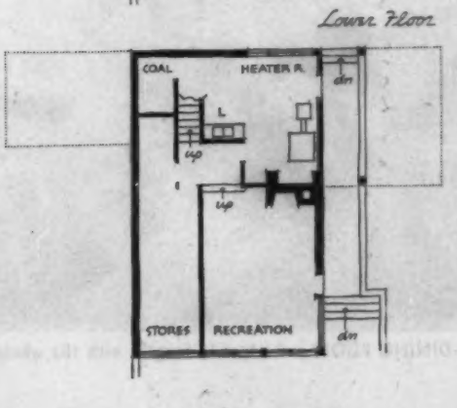
LITTLE SWITZERLAND

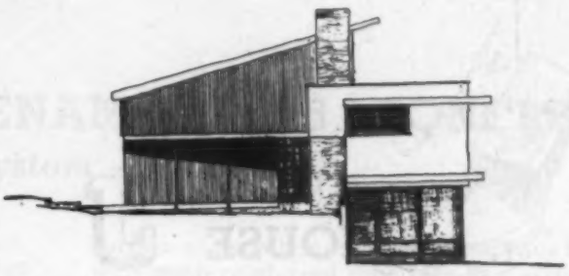
ALFRED and JANE WEST CLAUSS

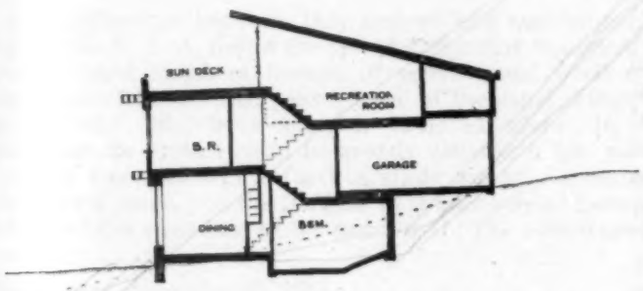
Yet to be built, House H is arranged as a three-story scheme, with an above-grade recreation room planned on the lower floor along with heater room, laundry, and storage space. Centralization of garage entrance, front door, and service court is an important plan item. The entire end of the living room, cantilevered out over the lower floor, is glazed to encompass the broad outlook. Both the kitchen and the dining room open onto the living porch which facilitates serving of outdoor meals in summer.

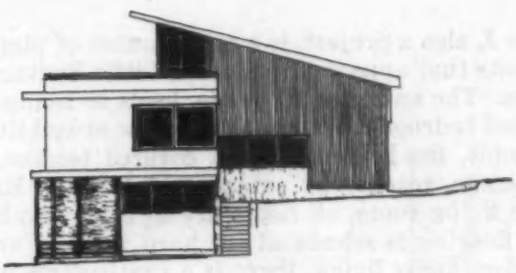






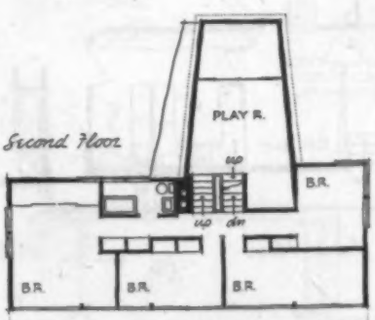


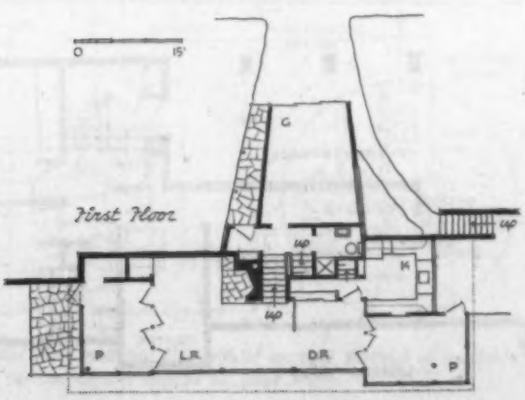




HOUSE I

This house, now under construction, departs in plan from all of the other houses. On the first floor, while it utilizes the extreme openness that is found in House A, it is quite dissimilar in that the living room, dining space, and kitchen all occur on this level. The particular site suggested the extension of the garage-workshop toward the street for easy access. This, in turn, gave rise to the upper level recreation room with its broad roof deck extending the full width of the house. The bands of sliding windows on the southern, view side are practically a Clauss "standard"—used repeatedly, as the designers tell us, "because they work so well."



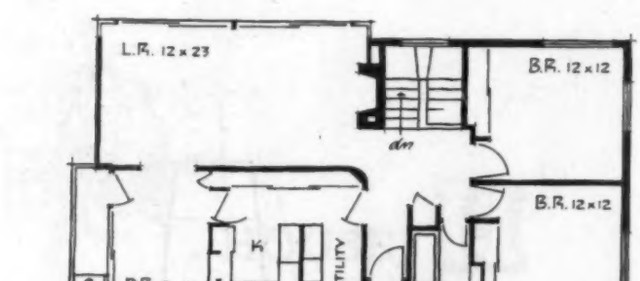


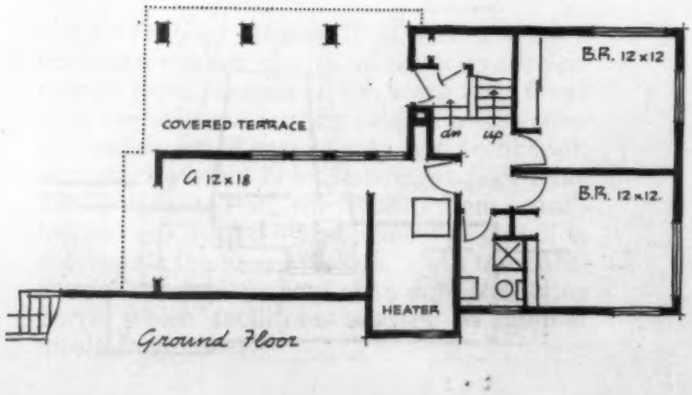
HOUSE J

LITTLE SWITZERLAND

ALFRED and JANE WEST CLAUSS

House J, also a project, is a combination of planning elements that appear in the other Little Switzerland houses. The entrance, at grade, leads to living, dining, and bedrooms. On the floor below are additional bedrooms, the heater room, a covered terrace, and the garage, reached by an access driveway. Except in the living room, all floors are of concrete; living room flooring is scheduled for hard wood. For privacy for family living, there is a particularly happy relation between location of the living room and the front door.





STEEL, PORCELAIN ENAMEL, and CONCRETE
Combined in a Structural System

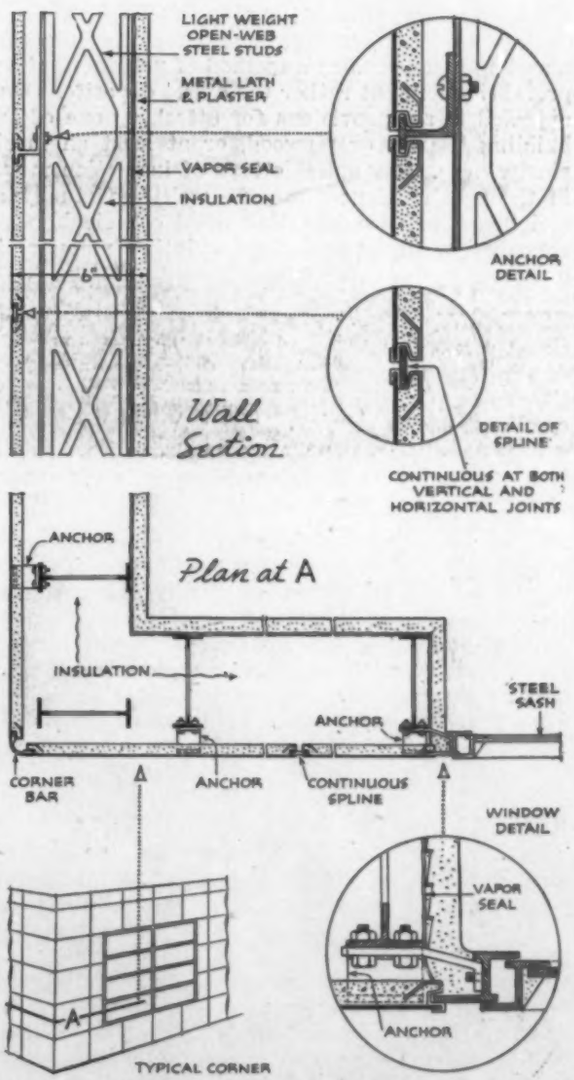
The Journal of the Royal Architectural Institute of Canada presented, in its July 1945 issue, an article* by James A. Murray proposing a new technique for combining lightweight stock steel structural shapes with an exterior surface of porcelain-enameled steel pans backed with mesh-reinforced concrete. The system, intended for use in many types of buildings, and its potential advantages are described in the following report.

The chief difference between this system and conventional practice in the U. S. A. lies in the use of unfamiliar materials: lightweight steel members instead of conventional wood or masonry; porcelain-surfaced pans instead of the usual shingle, clapboard, brick, tile, terra-cotta, or stone exteriors. It is probable that the system could be greatly refined; it has certain clumsy elements which further study might eliminate. But it achieves much, and the familiar in it may help to hasten acceptance of the principles which underlie it. The advantages are tangible:

1. Permanence, incombustibility.
2. Simple mechanical assembly methods as opposed to mortar joints or to cutting, fitting, and nailing, all of which consume expensive time.
3. Airtightness (see later discussion).
4. High insulating value, obtainable by installing any type of insulation desired.
5. Substantial reduction of condensation.
6. Possibility of using color extensively on building exteriors.
7. Extremely light total weight: 15 lb. per sq. ft.
8. Low maintenance costs.

STRUCTURE

The permanence of the finish is undoubted. The steel members are of course incombustible, although, lacking fire-resistant covering, they would be easily destroyed by fires originating in interior woodwork, furnishings, etc. In many ways the structural system does not approach the coldly logical maximum of efficiency, which might increase such advantageous factors as lightness, rigidity, etc. Adoption of such a simple device as pre-assembling structural panels, perhaps with wall framing members in a grid or diamond pattern, would surely have eliminated many small parts and thus reduced the necessary materials and labor. The construction is apparently amply strong for most ordinary purposes, and stress analyses of every part can be made easily by routine engineering procedures to determine suitable sizes, loadings, and factors of safety. It is essentially a braced box in which wind loads, according to the author, are transmitted by the steel studs to the floor beams and interior columns. For multi-story buildings in particular, the author suggests, the lightness of the total wall construction facilitates placing columns back from the building line, and cantilevering continuous floor beams to carry the walls. This would permit complete freedom of treatment of the exterior.



Details show essential elements of system. Method of assembly and further details appear on page 86.

* "Prefabricated Exterior Walls, Air-Sealed Buildings and Color Treatment," by James A. Murray.

Almost as an afterthought, Mr. Murray declares: "For house construction, 2″ x 4″ wood studs may be used instead of steel studs to reduce cost." Which leads one to believe that he is interested chiefly in the wall surfacing!

EXTERIOR SURFACING

Outer surfaces consist of porcelain-enameled steel pans, backed with concrete reinforced with wire mesh. The panels can be made any shape or size, up to 20 sq. ft. in area. For ease of erection, they have been limited to 6 or 7 sq. ft.; they are ½″ thick. Each panel is secured to the structural frame at four points with anchors that fit into continuous slots on the panel edges. A unit of this area, so supported, reportedly will withstand a load of 80 lb. per sq. ft. without appreciable distortion. Panels are slip-jointed together vertically and horizontally between anchors with flat splines, which provide for contraction and expansion and exclude the elements. Panel edges consist of separate strips formed to the necessary shape; this would produce a narrow "border" around each panel. If the steel sheet which constitutes the panel base could be shaped to form the desired edge, another item of material and some pre-assembly time—and a feature possibly disadvantageous to the designer—might be eliminated.

INTERIOR SURFACING; INSULATION

For inside surfaces, the designer proposes placing a vapor barrier over the structural frame, applying metal lath and plaster to form the wall surface. This, like the conventional organization of framing, is also contrary to the expected in a system announced as a method of "prefabrication." It is *not* prefabrication, but rather the direct opposite. One would have expected to see provisions for attaching one of the numerous building boards, or plywood, or at least an insulating-board plaster-base. Any suitable type of insulation may be installed in the construction; since the wall is virtually airtight and moisture-proof, condensation could conceivably be held to extremely low limits and the insulating material is thus well protected.

ASSEMBLY

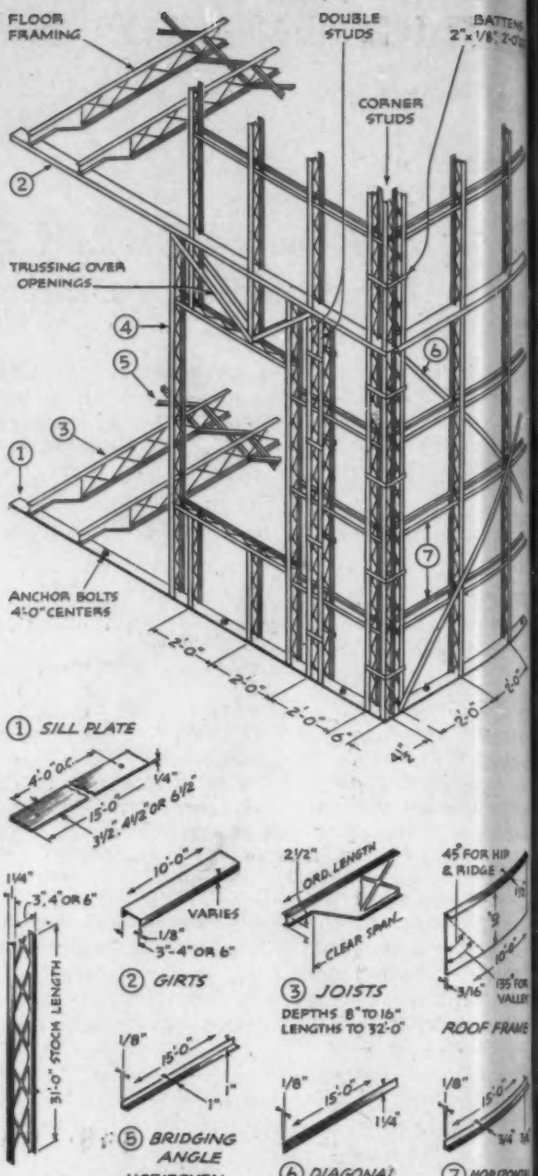
Great stress is laid upon mechanical assembly as opposed to, for instance, assembling masonry units with mortar joints. This is true of the outside skin only, in which slip-joints are employed exclusively. It is far from true of the frame, of which details are shown assembled with bolts and screws, rather than by friction or welding as is the case with several materials on the market.

In comparison with a masonry or wood outer surfacing, the mechanically assembled panels have distinct possibilities: speed of construction is potentially greatly increased, and the building can be closed in regardless of weather and temperature without impairing the ultimate strength of the wall. The whole wall assembly is quite comparable to typical domestic electric refrigerator construction. It should be noted, however, that the construction contains no provisions for interrupting heat-flow through the metallic members from outer to inner surface, or vice versa.*

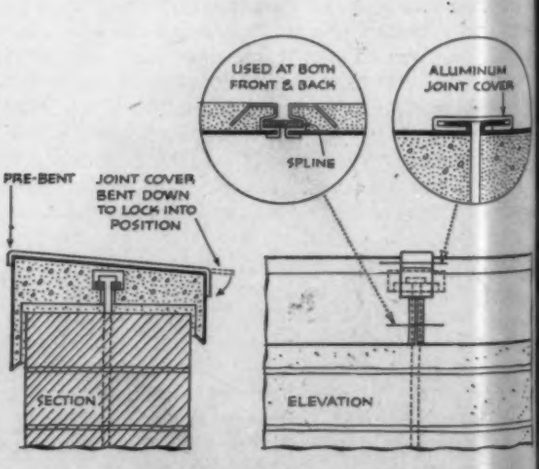
AIR-SEAL and COLOR

The author, Mr. Murray, is impressed with the value of an air-sealed construction, and the availability of color in porcelain enamel. He ascribes the deposit of dirt films on interior wall surfaces to the passage of air through wall construction, neglecting the condensation of indoor atmospheric moisture on inner faces of cool exterior walls, etc. He expects interior decoration to last five times as long on air-sealed construction as on standard construction. He claims low maintenance costs on this account, seemingly regarding it as equal in importance to the admittedly low cost of maintaining porcelain enamel.

* *See "New Developments in Steel Construction," by Carl F. Block, Progressive Architecture, Jan. 1946.*



Parts and method of assembly are strongly reminiscent of conventional wood framing practice.



Method of capping a masonry coping—a detail necessary because many outmoded building codes still require masonry parapets.

DAYLIGHTING FOR HOSPITALS . . . PART II

By ISADORE ROSENFIELD, Architect and Hospital Consultant

(The previous part appeared in December, 1945.)

Fairly accurate analysis of design in respect to orientation is possible either in the flat from drawings, or with models, by the application of local meteorological data. A more formalized analysis can be made of drawings by using curvilinear diagrams such as the "Burnet Diagrams" (Figs. 3, 4, 5) and by the "Heleodon" (Fig. 6).

It is easy enough to orient a single cell or a simple structure properly. Henry N. Wright's study, previously referred to, is based on the analysis of a five-room house and a one-room weekend house. But modern buildings, particularly hospitals, are usually so complex that they may not always lend themselves to ideal orientation. View from the rooms or wards is as important psychologically as sunshine. Therefore judicious compromises in orientation must frequently be made.

The British report shows several diagrams of building shapes which, when properly oriented, will exploit sunlight to the maximum (Fig. 7). Most of the shapes shown are not suitable to hospital purposes and are the product of constricted sites and the traditional approach to planning. The writer finds the T-shape (Fig. 8) ideal for most general hospitals, up to about 700 beds. In this case the nursing units are placed in the head of the T facing southeast, while the stem accommodates the various diagnostic and therapeutic facilities. He finds the L shape very good; some of his designs for buildings of 1,000 beds or more are a combination of L's. This is true of the building for bedridden custodial chronics on Welfare Island, N. Y. (Fig. 9). While the T-shaped building would have two nursing units per floor, the double L would have four nursing units, one in each leg of each L. In the new Sea View Hospital for Tuberculosis there are to be three nursing units per floor, hence the Y shape (Fig. 11). In all these examples the patients are disposed toward the sun for at least part of the day and such services as bathrooms, utility rooms, serving kitchens, etc., occupy the sides of the corridor least likely to get direct sunlight. An interesting example of a simultaneous exploitation of orientation and view, for a hospital of about 1,600 beds for the chronic sick, for whom great height of building is considered undesirable, is Goldwater Memorial Hospital, located on a narrow island (Fig. 10). In order to afford patients a river view on either side of the island, wards are disposed in four chevron-shaped buildings, each four stories high, with two nursing units per floor per chevron.

The English diagram (Fig. 7) also shows a U shape as desirable. In the writer's opinion this is not very satisfactory for a hospital from the point of view of internal organic arrangement, notwithstanding the fact that ever so many hospitals *are* U-shaped. Which gives point to the principle that what is good for one type of building may not be good for another, and that orientation alone can not be a determining factor in shaping a building.

BUT WHAT OF THE WINDOWS?

Orientation alone is not enough. The next problem is treatment of the envelope of a building so that it will admit daylight. Traditionally, the window is an aperture in an otherwise solid wall. Precisely why is that not satisfactory?

(a) From the point of view of quantity of light such a window is inadequate because according to law it could not ordinarily be wider than 25% of the length of the wall. Only at the window would there be ample light (Fig. 12).

(b) From the point of view of eye comfort such a window is unsatisfactory because it causes disturbing "brightness contrast." To exaggerate somewhat, it is like looking at an

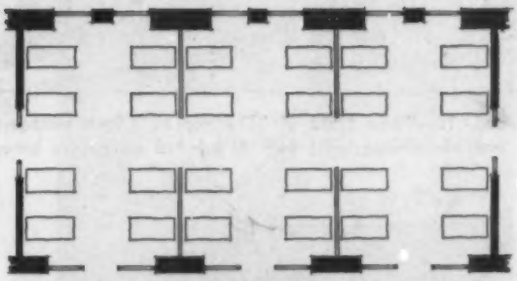
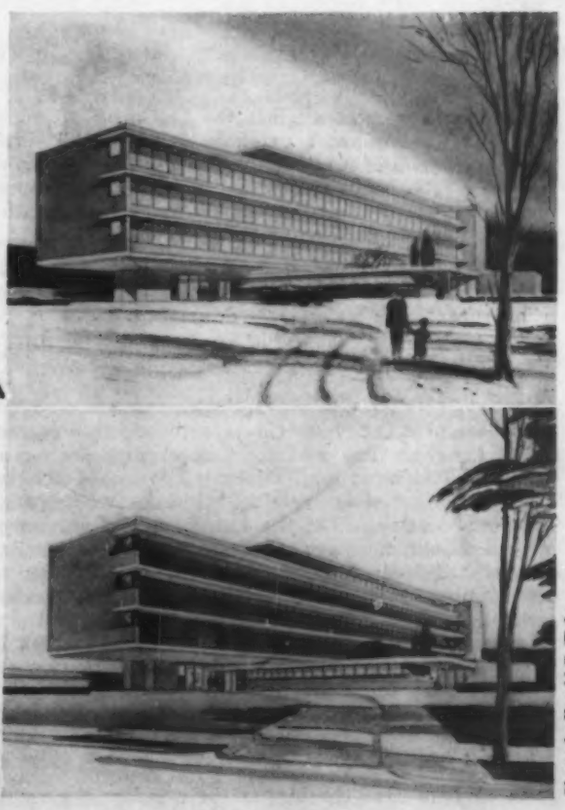


FIG. 16—Plan, typical 24-bed Riggs ward.

Dept. of Reproduction Section

FIG. 17—Triboro Hospital, New York, N. Y. Eggers and Higgins, Architects.



A

B

Photos by Harold E. Wells

FIG. 18—A, winter view; B, summer view, showing relative sunlight penetration, proposed Faith Hospital, St. Louis, Murphy and Corrubia, Associated Architects.

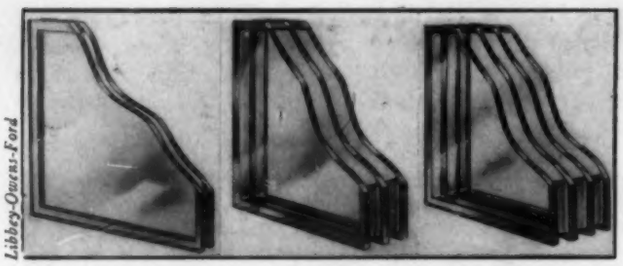


FIG. 19—Three types of "Thermopane," factory-made-to-measure multiple glazing units with dehydrated air spaces between panes.

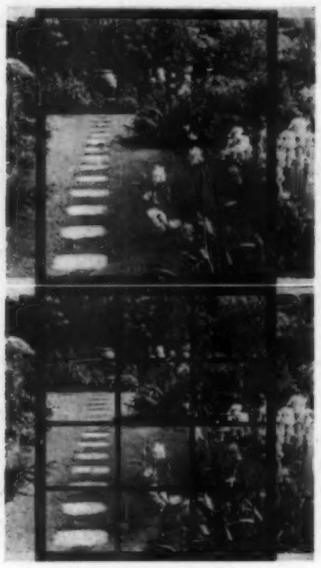


FIG. 20—Effect of muntin bars or other subdivisions on view through a window.

automobile headlight against the blackness of night (Fig. 13). The window and a patch on the floor are very bright while the surfaces surrounding the window appear black by contrast. The housewife who lives in a traditional house knows full well that her curtains are not all decoration, that they also serve to soften brightness contrast.

(c) From the point of view of being able to see the outdoors, the traditional window is very limited, especially when reveals are excessively deep (Fig. 14).

(d) From the germicidal point of view the traditional window is most unsatisfactory. Dr. Buchbinder gives meaning to this in the following words:

"If we could actually see the streptococci in a scarlet fever ward, here is what we might observe: entering about 9 o'clock in the morning, we examine one of the patients. Many streptococci are seen in his nose and throat. (There follows a description of the distribution of microorganisms on and around the patient, the bed, and the attendant.) A glance at the air of the room next reveals a fairly uniform distribution of streptococci, except for a temporary concentration within a radius of a few yards of the patient who has just sneezed, and around a bed . . . which is being changed . . . also . . . streptococci are settled on the floor in a regular manner. Further study of the floor reveals many organisms which tend to gather near the beds and *diminish in number around windows, particularly at the southern end of the room.*"

It is obvious that the bigger the window the smaller are the wall areas around it, until, if the window should reach from partition to partition, the darkness would disappear entirely from either side of the window, and partition walls would be so well lighted as to produce no annoying brightness contrast. What is true of the sides is equally true of the head of the window. The nearer the head to the ceiling, the narrower the dark overhead strip between head and ceiling. If the window extended clear to the ceiling the dark strip would be entirely eliminated. The ceiling, brightly illuminated, would produce no bright contrast with the window. It is also true that the closer the window head to the ceiling, the farther will light penetrate into the room (Figs. 14, 15).

POSITION OF BEDS FOR VIEW AND COMFORT

But even if enough light is brought into a room under conditions that eliminate brightness contrast, the patient's comfort is not insured unless wards and rooms are planned with due regard for it. The traditional hospital, particularly the British type, has what is known as the "barracks" plan, or more politely, is of the perimeter type. In this arrangement there is generally a separate window for each bed. The patient lies with his head to the wall. The best light is at either side of him, the poorest immediately at his head, where light *should* be good for reading and medical examinations. What is worse, he is confronted across the ward by windows which present the worst possible condition of glare and brightness contrast.

A well person sometimes may be able to adjust his position in a room so as to avoid glare, brightness contrast, and shadows, and at the same time to see the view out the window—though not always in a school, office, drafting room, shop, or indoor place of assembly. The bedridden seldom can; yet they should be the last to be called upon to endure avoidable discomfort. Hence the Riggs ward (Fig. 16). In this arrangement the patient lies parallel with the outside wall instead of perpendicularly to it. If he wants to look outdoors he has but to turn his head. He does not have to look at the window if he does not wish to. Conditions for reading and writing in bed, as well as light for examination, are also good.

PROBLEMS OF BIG WINDOWS

The civilized world has had hundreds of years' experience with individual windows, and accordingly has developed many devices for solving their problems. To what extent are these devices applicable to modern conditions? Without prejudice to individual windows where they may be justified, it must be admitted that big windows or glass walls do present new problems; but these can be solved.

1. The first is control of strong sunlight when it is not wanted.

This is usually solved by pulling down the shade; however, this eliminates ventilation and plunges the room into darkness.

A better way is to introduce a shelf, outside, over the window (Fig. 15). It must be designated with regard for the solstice in relation to height and depth of the room. The shelf should be of such projection as to permit sunlight to penetrate the room in the months of the year when it is wanted, and to cut off sunlight when it is not wanted. Of course Venetian blinds would in a measure take care of this problem, but some people do not like the dust they collect. Exterior vanes of proper adjustment afford another solution, but on western exposures enforce another compromise; one might have to give up such pleasures as a view of the sunset during the short summer months.

It is a mistake to try to solve the problems of all three sun exposures (east, south, west) with one device. Better results are obtainable if each exposure is analyzed separately, and treated accordingly. Such an approach may result in new esthetic opportunities for the alert, sensitive designer.

At Goldwater Memorial and Triboro Hospitals (Fig. 17) balconies at each floor were made five feet wide and adjusted more or less scientifically with respect to height and depth of patients' rooms. Where balconies are not needed shelves may be perforated to increase air circulation. The

same results can be obtained with more numerous but narrower horizontal vanes, but these may shut off the sky view. Horizontal shelves used at every story (or more frequently, as vanes) not only perform the function of cutting off undesirable intense summer sun; they also act as reflectors to help diffuse light evenly through the interior (Fig. 18 A, B).

Direct sunlight and glare can also be controlled by the glass itself. Figured glass in the upper part of the opening would serve to diffuse light. On the other hand glass is not always satisfactory as a diffusing agent because it may transform general glare into a myriad of glaring points.

There were on the market just prior to World War II clear plastic sheets with louvers cast into them, primarily for use in lighting fixtures. So far, this type of material has not had sufficient stability under extremes of heat and humidity to promise complete satisfaction, but the principle of its composition is sound. Perhaps sheet glass can be manufactured with reflecting strips cast in, just as wire mesh is cast at present.

2. Another set of problems has to do with heat, or heat loss, and weather protection.

The small window has the virtue of resulting in low heat loss. If weather-stripped and protected by storm sash or integral double glazing, it is perfectly satisfactory so far as heat loss is concerned. On the other hand it does not bring much heat into the room when that would be desirable in winter.

For the "solar" house it is claimed that plenty of glass facing south actually brings heat into the house and thus cuts down the fuel bill. The claims have produced some doubting Thomases. The only way to evaluate the amount of fuel that could be saved by a large expanse of glass would be to build two houses of the same plan and cross section side by side; one with walls of glass facing south and the other with traditional "hole-in-the-wall" windows.*

The reader may very well observe at this point that if a glass wall allows heat to penetrate in winter, it must afford too much heat in summer. The described means of cutting off summer sunlight offset this action; shelves or vanes will stop the nearly vertical summer sunlight, but do not interfere with the low-angle sunlight of winter (Fig. 18).

Assuming that direct sunlight does help to keep the house warm, what happens when the sun goes down or when it is overcast? Is there not more heat loss then, due to the large surfaces of glass? Again, this question has yet to be studied scientifically and answered categorically. All that can be said now is that double sash or prefabricated double glazing and weather-stripping seem to do the job. Winter sash or permanent double glazing sharply reduce surface heat loss and infiltration.

3. A third problem of large windows has to do with cost.

Building professionals know that the individual window-in-the-wall is generally costlier than the equivalent solid wall. A whole row of window units installed in a single wall opening is cheaper per unit than the individual window-in-the-wall, but still generally more costly than a solid wall of equal area.

A recent study revealed the extent to which our thinking has been warped by the traditional approach. The individual traditional window has not only to supply light but has also to protect the interior against intruders, weather, insects, strong light, and exterior temperature; it has to furnish ventilation and insure privacy. When equipped to perform all these functions, it becomes expensive. As we multiply this type of window we multiply hardware, storm sash or double glazing, weather-stripping, and screens. Thus, a six-bed ward, traditionally designed, would have two windows, each equipped with all the devices listed. The same ward, contemporarily designed, would have at least four such window units. Must all the gadgetry be quadrupled? Decidedly not. Two of the four windows may be inoperative, permitting two sets of hardware and two screens to be omitted, reducing costs for the entire bank to a total less than the cost of the wall it displaces.

Photos by Sigurd Fischer

FIG. 21—Laboratory building for Firestone Tire and Rubber Company, Akron, Ohio; Voorhees, Walker, Foley and Smith, Architects.

4. Clouding and frosting of glass has long been a problem, one fairly well solved for traditional windows by storm sash.

Contemporary design calls not merely for more windows, but for larger areas of glass uninterrupted by muntins, mullions, or transom bars, in order to interfere as little as possible with the view outdoors (Fig. 20). Storm sash in the same proportions are out of the question because of the difficulty and hazard of handling; yet without some protection much condensation may accumulate on the window sill and floor under certain conditions of relative indoor and outdoor temperature and humidity. In store show-windows special drainage facilities are provided in the bottom members of the frames. A more plausible arrangement in hospitals would be double glazing, and the form of double glazing which offers the most positive protection would seem to be the factory-assembled unit consisting of two or more layers of glass with mechanically sealed edges and dehydrated air spaces between layers (Fig. 19).

WINDOWS AND AIR CONDITIONING

The load imposed on an air-conditioning system by sunlight impinging directly on glass can be considerable. But the contemporary sun-shields previously discussed eliminate this difficulty in summer, when sun heat must be counteracted. Also, multi-layered glazing can be obtained with insulating value comparable to that of a 12" masonry wall furred 4" and plastered.

Voorhees, Walker, Foley and Smith, architects, designed the research laboratories for the Firestone Company in

* Such a demonstration study is being made by Purdue University under a grant from the Libbey-Owens-Ford Glass Co.

Dick Whittington

FIG. 22—Tempered plate glass used in entrance doors.

Akron, Ohio, for complete air conditioning; at the same time, they considered it important that laboratory workers should enjoy a view of the outdoors. As they also wanted a constant level of illumination they relied for lighting entirely on fluorescent units, and installed the "picture" windows (with double-glazing-plus-air-space) to provide the view (Fig. 21). This has important implications for hospital designers; in all likelihood future hospitals will be one hundred percent air conditioned. Non-believers in extensive daylighting may disagree with the wisdom of requiring all air-conditioned spaces of a hospital (particularly operating rooms, and fluoroscopy and X-ray processing rooms which must be kept entirely dark) to be daylighted. But air-conditioning systems, like all mechanical devices, may conceivably fail, and unlikely though the occurrence may be, no hospital can afford not to supplement its air-conditioning system with means of obtaining natural ventilation. Furthermore, claustrophobia is a positive factor that cannot be overlooked.

In one of the best hospitals in New York, I am informed, when the operating rooms were first blacked out at the beginning of the late war, two principal surgeons fainted during an operation. A check of the ventilating system showed temperature, humidity, and all other conditions in the operating room to be in perfect order. It was concluded that the surgeons fainted from claustrophobia, possibly coupled with some unpleasant brightness contrast.

From the previous discussion of the bactericidal quality of daylight it is also obvious that the value of daylight in keeping down cross-infection, at least in operating and delivery rooms, infant nurseries, pediatric wards, communicable disease wards, surgical supply, pre-operation, and formula rooms must not be overlooked. For these areas ample daylight becomes a *must*. In fluoroscopy and other dark rooms, windows are desirable in case of failure of the air-conditioning system. Also, a fluoroscopy room should be irradiated once in a while as, otherwise, germs in these rooms of perpetual darkness could stay alive a long time.

Many animals used for laboratory purposes are easy prey to pneumonia and other communicable diseases. They have to be kept healthy by protecting them from drafts and keeping the atmosphere clear of germs. Human lives depend upon the well-being of laboratory mice and guinea pigs. In laboratories, then, the use of actinic glass would seem fully justified.

Of course windows do no germicidal good at night. That is no argument against daylight, but rather an argument for supplying artificial irradiation at night; in fact, for employing it during the day at points where daylight may not penetrate with germicidal effectiveness. Two agencies are better than one; both should be used when we deal with human suffering and matters of life and death. Not only should there be ample glass but some of it should be operative, for the reasons outlined. Also, even where windows are intended primarily for view, some sash should be operable to facilitate cleaning, repairing, or reglazing.

SKYLIGHTS

It has been a frequent practice in hospitals to place such services as kitchens, laundries, shops, even dining rooms, in basements or sub-basements. When commercial buildings are deprived of proper daylight and ventilation the offense is against those condemned to earn their bread in an unhealthful environment, but when food is prepared and served, and laundry for patients is prepared, in unhealthful conditions, the patient as well as the worker suffers, for bacteria lingering in kitchen, dining room, or laundry are very likely to be carried to the patient. For this reason it has been the writer's practice to plan these departments above ground; in any case, to provide them with ample daylight. As these functions require deep areas, it is not easy to light them from the perimeters. To light them properly, some form of overhead light is desirable.

It has been my observation that we have something to learn about overhead lighting. All flat-with-the-roof or sloping overhead means of admitting light are likely to transmit excessive heat in summer or cold in winter, and to leak sooner or later. This leaves us monitor and saw-tooth lights. Both have vertical (or nearly vertical) sashes like ordinary windows. Monitor lights are often preferred because saw-tooth lights are reminiscent of factories. However, selection of roof-lighting means is not a matter of likes and dislikes, but one of proper delivery of light and air. If we are primarily interested in ventilation, monitors should be selected because they permit breezes to blow from one side to the other, at the same time siphoning out vitiated air. A monitor light, however, is not very efficient as a light-diffuser; light, like the breeze, travels from one side of the monitor to the other and there is scant opportunity to deflect it downward to the point of use. The saw-tooth light, on the other hand, deflects light downward from its inclined soffit, diffuses it, and eliminates at least one-half the source of brightness contrast (See Fig. 1, Dec. 1945). If the soffit could economically be curved in section, it would be even more efficient as a light reflector. The monitor could be made more efficient as a deliverer of light by making its roof a double incline pitched to the center. This, however, would interfere with ventilation; such a monitor would become a pair of saw-tooths back-to-back. The sashes of overhead lights, to be most satisfactory from a leakage point of view, should be vertical.

WHAT OF THE GLASS ITSELF?

In warm climates, to admit daylight, all one has to do is to eliminate walls; protection would be necessary against insects, hurricanes, or direct sunlight. In relatively cool climates it is necessary to deal also with cold, rain, snow, etc. Many special types of glass have been devised to meet these problems.

Tempered plate glass is an answer to an important problem of light transmission as well as of vision. A few years ago the entrance of a large hospital, which looked out across the East River toward Manhattan, was designed in the Romanesque tradition; that is, as a small opening in a heavily encrusted, ornamental masonry wall. I pointed out that the architects were missing the opportunity of bringing in the beautiful view across the water and also that the lobby would be dark. The architects indignantly asked whether I expected them to design a jewelry-store front or a hospital. My answer was, "A jewelry-store front." Accordingly, the architects opened the whole front of the lobby to the river—so far as masonry was concerned; but they nullified the promise of light and view by encumbering the glass doors and transoms with much bronze work. Tempered plate glass would have solved the problem. Today glass doors almost entirely unencumbered by metal are practically the rule in stores and public buildings (Fig. 22).

Laminated glass is used when greater strength is desired. Both tempered glass and laminated glass are particularly useful as glazing for institutions for the mentally sick. To avoid breakage and to prevent irresponsible patients from escaping, such glass must be confined to small dimensions and held securely in metal frames or muntins.

Heat absorbing glass, a relatively new development, offers a limited means of coping with summer heat. With ordinary glass most of the heat rays contained in sunlight pass through into the interior; very few are absorbed by the glass itself. A glass of special chemical composition and of slightly bluish-green color absorbs a good deal of sun heat (the absorption depending on glass thickness) and then releases it, partly indoors and partly outdoors, in quantities according to prevailing conditions inside and out, such as temperature, wind velocity, etc. (**Fig. 13, Dec. 1945**).

Glass fabrics can be used as curtains to eliminate glare and diffuse light.

For many years laboratories have been faced north to insure even quality of light. That rule had validity only as long as laboratories consisted of a few rooms. In modern times laboratories, even in hospitals, occupy extensive suites, frequently several stories, often whole buildings. Certainly it would be uneconomical, even if physically possible, to place all laboratories facing north. Nowadays laboratories may face in any direction; some laboratory workers prefer the warm quality of south light provided they are safeguarded against glare and brightness contrast.

The windows in the Hoffman-LaRoche laboratories are enormous, glazed with double-glass-plus-air-space, and protected with curtains of glass fiber (**Fig. 23**). When the laboratory workers find the sun annoying, they draw the curtains, which diffuse the light and contribute to thermal insulation. Also, curtains of glass are fireproof—a very important consideration in laboratories where there is danger of fire or explosion.

Actinic glass, such as "Vitaglass," transmits about 60% of the ultraviolet spectrum. Although it loses some of this property during the first year or so after installation, enough remains to merit consideration. It has been considered a health-contributing agent but, as far as I know, little attention has been paid its germicidal potency despite the fact that ultraviolet radiation is known to be lethal to pathogenic organisms. Other factors being equal, actinic glass is preferable to ordinary glass from the germicidal point of view.

WHAT WE DO NOT KNOW ABOUT DAYLIGHT

We know that, if there *is* such a thing as too much light during short periods, there is no such thing as too much glass, because with the utmost of glass it would still be impossible to obtain outdoor conditions, yet the maximum of daylight, once obtained, can be controlled with well tested devices. But merely to conclude that the more glass the better is not enough. It is sound in direction, but not intelligent.

We have yet to learn a great deal about light in terms of window arrangement, shielding from excessive sunlight, and the qualities of glass itself. The bacteriological experiments referred to are proof enough that we need to admit more daylight into interiors, but they fall far short of informing architects of the techniques of proper installation. In such research scientists have been concerned with one question only: *Is daylight, passing through glass, lethal to germs?* What the architect wants to know is: *What happens if the glass is single thickness, double thickness, ⅛" plate glass, ¼" plate glass; what if storm sash are used; what if prefabricated double glazing employing different thicknesses of glass, or two sheets or three sheets, is used; what of the various kinds of figured and tinted glass? If actinic glass is more lethal than an equivalent thickness of ordinary glass, then in what form is it obtainable, and is the difference of lethality sufficient to compensate for the difference in cost?*

Other things being equal, *what is the relationship between lethality and depth of room?* Hospitals nowadays are planned with beds up to four in depth from the window. *What is the relationship in lethality as between the first bed, second bed, third, and fourth beds?* In nurseries, pediatric wards, and contagious-disease wards, beds are not only arranged in depth but also separated by glass screens. *What of the germicidal effectiveness of daylight after it has passed the first, second, and third screens?*

These are but a few questions that require answers. Others have been posed in this discussion. Many others will occur to the serious student as he delves into the problem.

The full import of the facts we now possess, and the techniques for their most effective employment in actual planning and construction, must be suitably publicized. What has yet to be ascertained about glass, daylight, and windows must be scientifically studied, and the results brought to the attention of the public and the building designer. This, in the last analysis, has to be a cooperative effort between consumer, designer, and manufacturer. It involves not only glass manufacturers but also window, hardware, screen, and other manufacturers. It involves the designer, and the bacteriologist, and the clinician.

Photos by Gottscho-Schleisner

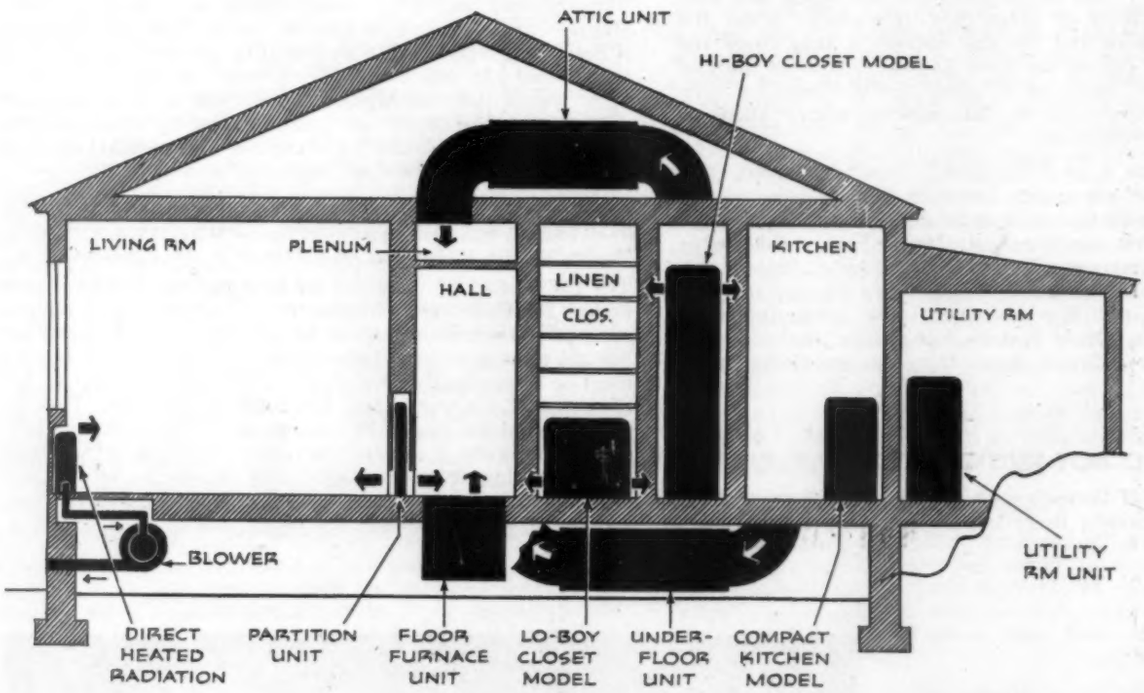
FIG. 23—Laboratory building for Hoffman-La Roche, Inc., manufacturers of pharmaceuticals, in Nutley, N. J. Fellheimer and Wagner, Architects.

GAS HEATING EQUIPMENT

Types, Locations and, Venting Requirements

By H. P. MOREHOUSE, Chairman, Committee on Housing, American Gas Association.

What kinds of gas furnaces are becoming available? What is the best location for gas house-heating equipment? What is required for venting it? The answers to these and other questions are suggested in the following brief summary. The fuel form of gas makes possible unusual locations for heating equipment, permitting a flexibility in the design of heating systems which, coupled with new designs of furnaces, can be made to show savings in total house cubage and consequently in costs. This has great interest at the present time, when a tremendous house-building boom is in the making, when high construction costs render economy imperative, and when several million service men want homes.



FOR BASEMENTLESS HOUSES

In basementless houses there are at least nine possible out-of-the-way, space-saving locations for gas-heating equipment. All the equipment shown will function adequately without the draft that a chimney provides, but it is necessary to vent the equipment to remove products of combustion.

Attic Unit is a horizontal, forced-warm air heater designed to rest on the attic floor or on the ceiling joists. Heat is distributed downward, often into a plenum chamber and distributed either directly through registers or through a duct system.

Closet Unit, Tall ("Hi-boy") is a narrow, vertical, warm air unit, 19" x 28" in outside dimensions, which can be successfully installed in a very small closet.

Closet Unit, Low ("Lo-boy") is a new type designed to fit into the bottom of a small closet, leaving usable shelf space above. Warmed air is delivered through baseboard registers, helps keep floors warm in basementless houses.

Partition Unit is thin and narrow, designed for installation in a partition to heat one or two rooms; individual automatic controls will be available, and the unit furnishes radiant heat from ankle height to head height. This unit should be available in quantity by mid-year.

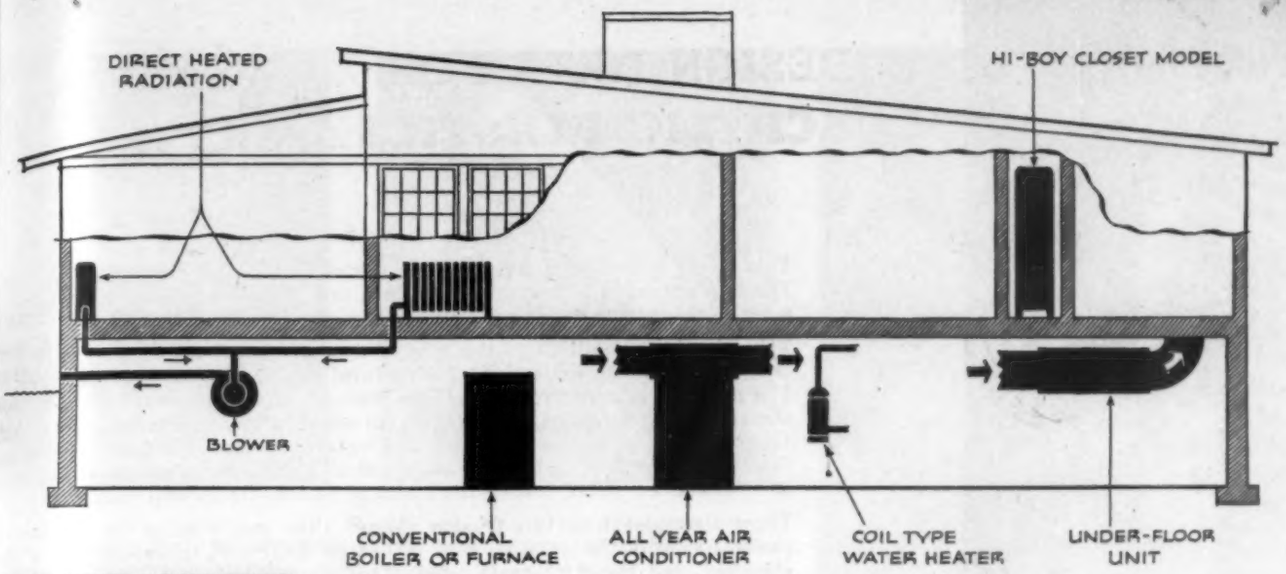
Utility Room Furnace, a conventional unit but extremely compact, will operate an air, water, or steam heating system.

Kitchen Unit, like the preceding one, can be a gas-fired central heater for any type of system; it has also been used as a small boiler connected to floor piping for panel (radiant) heating.

Floor Furnace has a grilled top outlet at floor level, familiar to many in the South and on the West Coast; a small under-floor space is needed for installation and servicing.

Individually Heated Radiators, used to a limited extent before the war, require either a mechanical exhauster (which may serve more than one radiator) or individual vents to dispose of products of combustion. Each radiator may be automatically controlled.

Under-floor Unit is the attic unit previously described, but suspended beneath the floor and connected to a duct distribution system. It requires under-floor space for installing, servicing.



OUSES WITH BASEMENTS

he conventional boiler or furnace may serve steam, t water, gravity or forced warm air (winter air nditioning), and all-year air conditioning systems. ouses that spread out over their sites may pose usual heating problems.

o heat a wing separated from the main building, n attic unit or a closet model might be used; a com-letely excavated basement is unnecessary.

ifferentiation in heating medium may be desirable, for instance, between maid's quarters and the rest a house. For small spaces radiation may be sup-lied by a conventional coil water heater, possibly ith its own thermostat.

ooms over unheated spaces, such as over garages, ften cool faster than others, may require separate eating unit. Coil heater, attic unit, or direct-fired adiation are suitable.

ndividual room temperature control can be simply btained by using direct-fired radiators with indi-idual thermostats. If a mechanical exhauster is sed, no chimney is required.

EW TYPES OF FLUES AND BURNERS

The Underwriters' Laboratories, Inc., have recently approved new method of chimney construction, a light-weight chim-ey which may be supported entirely by the house framing. The type approved for gas appliances only is known as *Type B*, is made of single-wall asbestos-cement pipe, and must be marked: "For gas appliance use only." Size of flue may never be less than size of flue collar on the appliance; " (diam.) round flues are suitable for heating equipment up o 35,000 Btu input, 5" flues up to 55,000 Btu, 6" up to 90,000 Btu. Other shapes must be equivalent. Attic cross-overs must be kept above 30° above horizontal (45° if possible). Connection from appliance to flue should be short as possible, pitch up at least ¼" per ft. If possible, flue should penetrate roof close to ridge to avoid having long lengths of flue pipe exposed and thus subject to excessive cooling. Several appli-nces may be connected to one flue if capacity is adequate.

A new gas burner for domestic appliances is being released o manufacturers by the American Gas Association. Previous burners required excess air to insure complete combustion; the new "100% primary air burner" draws in all needed air through an adjustable shutter, has a shorter, brighter flame which can be placed very close to object heated. The develop-ment makes possible even greater compactness of appliances, elimination of some parts, increased operating efficiency.

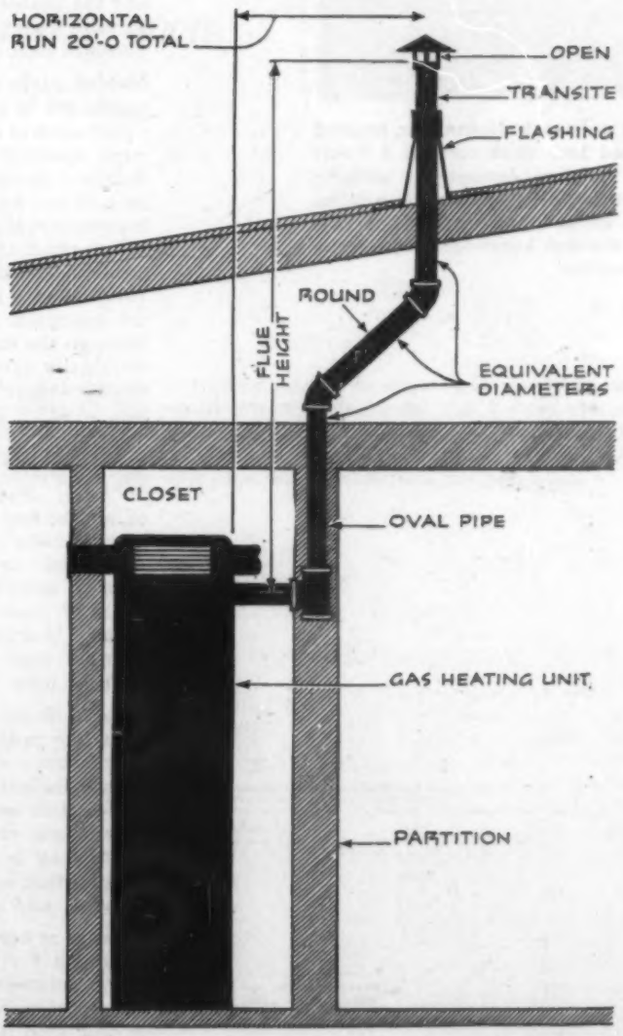


Diagram shows one method of installing new Type B flue approved *for gas appliances only* by Fire Underwriters. Made of asbestos-cement pipe, flue requires no masonry, can be supported on wood framing. According to A.S.H.V.E., total horizontal run should not exceed 20 ft in any case, and if flue height is less than 20 ft, horizontal run should not exceed flue height; other variables make competent advice necessary.

"Modern Plastics"

Plexiglas sculpture by Nishan Toor, mounted on a wood base which conceals a 7-watt bulb. The piece demonstrates effective utilization of the light-conducting qualities and the workability of acrylics, and indicates a thorough knowledge of the material's properties.

DESIGN DATA FOR ACRYLIC PLASTICS ...PART II

This is the second of a series of articles on plastics in relation to archite The first appeared in January, 1946; in it are contained data on the general acteristics, sources, trade names, etc., of acrylic resins.

There is almost no limit to the type of design suitable for execution in acr except the obvious limitation of structural strength when used architectu The material is easy to work, is free from grain, and can be sawed, drilled chined, routed, threaded, and swaged. In addition to all these methods of wo (borrowed from the woodworking and metalworking industries) acrylics ca formed to almost any curvature, mechanically or by air pressure, when heat 220° to 300°F. After cooling the material retains its formed contours.

Three-dimensional surface-tension shapes (like gun turrets for airplanes) easily formed. The acrylic sheet is heated until soft, clamped over a vac chamber, and the air is exhausted. This draws the sheet down to the des depth; the vacuum is maintained until the product has cooled sufficiently to its shape. Contour can easily be controlled by shaping the opening in the vac chamber, or "pot." The hot sheet is not in contact with any form, so the surf is not impaired and optical qualities are maintained. "Snap-back" forming quires a male form which is inserted over the sheet; the vacuum is released sl and the heated sheet snaps back to fit the male form snugly. Both types of vac forming require the acrylic sheet to be clamped to the form; the flange which becomes part of the formed shape can be used to advantage in securing the p

Molded parts may be manufactured by injection or compression; design requ ments are in general similar, and molding is usually faster, cheaper, and per closer control over dimensions than other fabricating methods. If design is int gent, molding also makes it possible to simplify or eliminate many assembly finishing operations. As far as possible, the cross section of molded pieces sh be uniform and the pieces should have rounded rather than sharp corners. Sh corners usually increase cost of molds. Filleted or rounded corners are far apt to crack than sharp ones. The material "flows" better in molds with rou corners, and dangers of sticking are reduced. At times, however, particularly portions of a design are to be emphasized with "wiped-on" pigment, sharp ed are essential. If holes are to be molded in, the hole should preferably pass enti through the material for ease in designing the mold; but depth of hole should ordinarily exceed twice its diameter, and holes 1/16" or less in diameter sho not be deeper than the diameter.

Sheet sizes. Acrylics are available in many thicknesses and sizes, from .060" .250" thick in sheets ranging from 24" x 36" to 40" x 50"; and in thicknesses .2 and from .375" to 2.5" (in ⅛" jumps) available from 20" to 48" wide by 36" 50" long. Special sizes and thicknesses are available at higher cost. In use, she of almost any available size can be used without danger of buckling if firm s port, usually at edges, is provided. Manufacturers state that a sheet 24" x 1 .250" thick; or a sheet 48" x 48", .375" thick, should be self-supporting. The sho door on page 96 is 6' high by ½" thick, and proves sound from the engineer point of view. Plastic should be free to move in a supporting channel-sha frame. Acrylics show less tendency to expand or contract with temperat changes than do other plastics, especially the acetates, but will change sh slightly more than will glass with temperature variations.

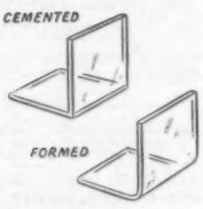
Colors. Sheet material is available at a slightly higher price in standard colo including reds, yellows, greens, blues, and whites; and colors can be matched extra cost. Acrylic powders for molding can be obtained in these and oth colors, including opaques, at no extra cost; colors of molding powders can matched to sample. If color is to be applied to the surface of acrylic produc alkyd base enamels, free of solvent ("four-hour" enamels) are recommend Paint may be applied with air-brush or an ordinary brush. No special surfa preparation is needed. If color is to be wiped on, however, dip-dyeing is reco mended, and a sanded surface will absorb dye more quickly than polished she

Mirrors of acrylic do not fog easily, but there is no special quality of acrylic she available for this type of work. Acrylic mirrors are not yet recommended manufacturers unless there is great danger of breakage or some such special of conditions which would make the use of glass impractical. Development wo in this field is still under way, and therefore it is difficult to be specific. Occ sionally a glass mirror has been cemented on top of acrylic sheet, but this obv ously destroys the anti-fogging quality. Acrylics are anti-fogging because th hold heat so much better than glass; i.e., their heat transmission is much les There is never the pronounced temperature differential between a room and th acrylic sheet in that room as there is with glass, and this tends to prevent th formation of steam on the plastic.

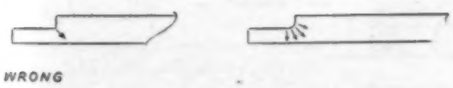
Photos courtesy Rohm & Haas, "Modern Plastics."

...t, obscure Plexiglas shade for table lamp. Center, cigarette lighter of laminated Lucite, ...h layer in different translucent color. Right, Plexiglas clips, picture frames, trays, boxes— ...mples of cementing and heat forming.

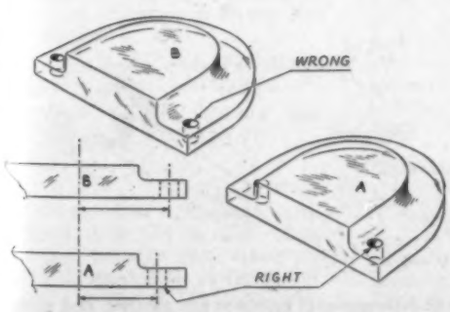
...ABRICATION: ACRYLICS CAN BE WORKED IN MANY WAYS



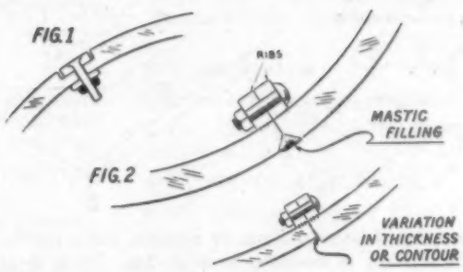
...hile cemented joints of good quality are easy to produce by handicraft ...ethods, their quality is difficult to control in mass production. Par- ...cularly in decorative items, consider adding dye or pigment to cement ...ther than attempting completely transparent joints, or obscure joint ...th engraving or molding. Better still in many cases is a heat-formed ...nt.



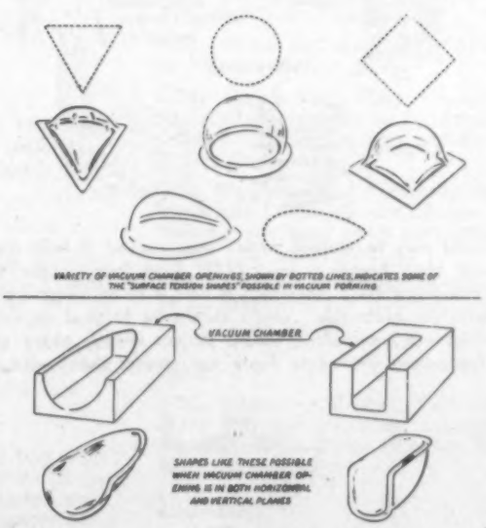
... routing, threading, etc., avoid sharp points or corners; they concen- ...rate stresses at a weak point, may cause fractures. V-shaped notch ...s only 65% strength of round-bottom notch.



...eep mounting holes for panels or parts close to a thick portion of the ...anel; and if routing is to be done, keep width and depth of routing ...niform to attain low production costs.



Multiple parts can be fastened together by mounting in a metal frame, as in Fig 1. This permits relatively thin panels. Fig. 2 shows another method, bolting together acrylic ribs cemented to circumferences of parts; matching formed parts may be difficult, outside contour of draw-formed pieces may vary; edges may be chamfered and joint filled.

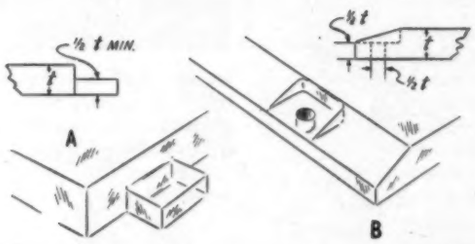

VARIETY OF VACUUM CHAMBER OPENINGS, SHOWN BY DOTTED LINES, INDICATES SOME OF THE "SURFACE TENSION SHAPES" POSSIBLE IN VACUUM FORMING
VACUUM CHAMBER
SHAPES LIKE THESE POSSIBLE WHEN VACUUM CHAMBER OPENING IS IN BOTH HORIZONTAL AND VERTICAL PLANES

Types of vacuum-formed acrylic shapes and the forms (or "pots") which produce them. Called *surface tension shapes*, these have good optical properties. Material thins out, approximately 1/3 in a 22"-diameter hemisphere at deepest draw. In "snap-back" forming vacuum is reduced and material constricts to fit a male form of proper contour.

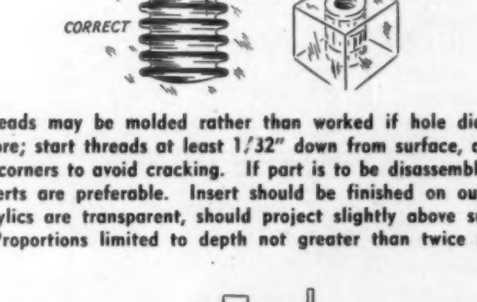
ACRYLIC PLASTICS

Portion of the Plexiglas "Dream Suite" recently designed and exhibited by the manufacturers shows acrylics used in many forms: rods, tubes, flat and formed sheets; opaque, transparent; plain, decorated; and lighted both internally and externally. Note size of pieces, ranging from furniture handles to the curved, sliding shower door.

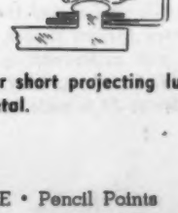
BASIC CONSIDERATIONS IN DESIGNING UNITS TO BE MOLDED



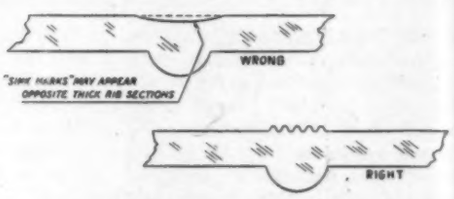
Cross section should be as uniform as possible, but assembly time may be saved by molding in mounting rims or lugs. These should be substantial; dimensions shown are minima, except that mounting holes are preferably of no greater diameter than ½ t, and should be set back from all edges of lugs a distance at least as great as thickness of the lug.



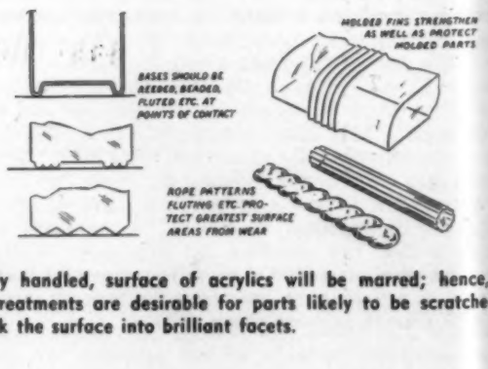
Screw threads may be molded rather than worked if hole diameter is ¼" or more; start threads at least 1/32" down from surface, and avoid all sharp corners to avoid cracking. If part is to be disassembled often, metal inserts are preferable. Insert should be finished on outside because acrylics are transparent, should project slightly above surface of plastic. Proportions limited to depth not greater than twice diameter.



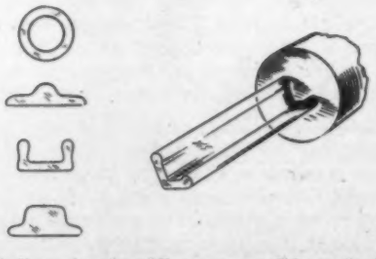
Molded acrylic "rivets," or short projecting lugs, can be used as shown for joining plastic and metal.



If ribs are used to reinforce an area, section may contract and show unevenly while cooling, due to greater volume of material. Cooling can be controlled to eliminate this but is expensive. Decoration of surface opposite rib overcomes the difficulty.


BASES SHOULD BE BEADED, BEADED, FLUTED ETC. AT POINTS OF CONTACT
MOLDED RING STRENGTHEN AS WELL AS PROTECT MOLDED PARTS
ROPE PATTERNS FLUTING ETC. PROTECT GREATEST SURFACE AREAS FROM WEAR

If roughly handled, surface of acrylics will be marred; hence, special surface treatments are desirable for parts likely to be scratched. They also break the surface into brilliant facets.



Many types of 3-dimensional moldings are possible, and advantage should be taken of the wide range of colors in which acrylics are available. For long parts in particular, extrusion is a fast, economical manufacturing method; it requires that the cross section or profile be uniform. Design should be discussed with an experienced extrusion molder.

MANUFACTURERS' LITERATURE

PROGRESSIVE ARCHITECTURE—Pencil Points, 330 West 42nd Street, New York 18, N. Y.
I should like a copy of each piece of Manufacturers' Literature listed.

We request students to send their inquiries directly to the manufacturers.

No.	No.	No.	No.
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Conditioning

4. *Packaged Cooling (L-389)*, 4-p. illus. folder on 3- and 5-hp packaged cooling units with radial compressors (Freon refrigerant) for use in business offices, hospitals, hotels, etc. Chrysler Corp., Airtemp Div.

5. *Refrigeration and Air Conditioning in Hospitals (Bulletin 502)*, 4-p. illus. reprint of article by Terry Mitchell, M.E. Notes on hospital requirements for refrigeration and air conditioning; suggested solutions and equipment. Frick Co.

Awnings

33. *Astrup Awning Equipment*, Astrup Co. Reviewed Jan.

Cement

46. *A Guide to Finer Stucco*, Medusa Portland Cement Co. Reviewed Jan.

47. *Light From Floors*, Universal Atlas Cement Co. Reviewed Jan.

Color Values in Vision

Series of 4-color illustrated booklets on scientific use of color in various fields, Pittsburgh Plate Glass Co., Color Engineering Dept.:

49. *Pittsburgh Color Dynamics (Adv. 225).*

50. *Pittsburgh Color Dynamics and Color Therapy for Hospitals and Institutions (Adv. 228).*

51. *Pittsburgh Color Dynamics for the Home.*

57. *Pittsburgh Color Dynamics for Offices, Hotels, and Restaurants.*

Concrete

52. *Haydite Manual, A Data Book for Designing Engineers and Architects*, American Aggregate Co. Reviewed Jan.

54. Illustrated folder on pre-cast "artery" concrete building block. Arthur L. Kuhlman Industries.

Concrete, Air Entraining

53. *Air-Entrained Concretes (Form 46-45-2)*, 8-p. illus. booklet on advantages of "Darex AEA" water-soluble compound mixed with cement, for controling amount of air entrainment in concrete. Dewey and Almy Chemical Co.

Copper

Two brief monographs of a series, showing details of copper applications to house building. Copper & Brass Research Association:

55. *Copper Valleys and Flashings for Residences (12-H).*

56. *Copper Roofs and Decks for Residences (12-H), Monograph II.*

Doors

38. *New Comfort Thru Bishop Venta-Glass Windows and Doors*, 2-p. illus. folder on glass louvers for standard windows; wood or glass louvers for standard doors; also for transom, partition, porch enclosure, ceiling ventilation designs. Nu-Air-Wa Co.

Doors, Garage

40. *A "Brand New" Overhead-Type Garage Door*, 4-p. illus. folder on an all-aluminum garage door which opens out from top at "fingertip" operation of counterweight mechanism. Berry Door Co.

Drafting Room Equipment

Folder and 28-p. booklet on machines for printing and developing black and white prints, Charles Bruning Co., Inc.:

4-41. *Just the Ticket (Model 41 Printer-Developer).*

4-42. *It's Positively Right in Bruning Black and White.*

4-37. *10 Types of Prints Instead of 1*, General Aniline & Film Corp., Ozalid Div. Reviewed Jan.

4-43. *Detail Engineers'-Glass and Universal Layout Scale for Form Grinders 50 to 1 Magnification*, 4-p. illus. folder on translucent scale of engineers'-glass for making chart drawings and layouts. Universal Engraving & Colorplate Co., Inc., Engineers Specialties Div.

Ductwork

4-44. Illustrated folder on insulated fire-resistant duct for high velocities, low condensation. Philip Carey Mfg. Co.

Electric Wiring Devices

5-28. *Bryant Superior Wiring Devices (Cat. 40)*, 120-p. illus. catalog. Classified listing of electrical wiring devices and accessories; prices; wiring diagrams; suggested standards of adequate residence wiring; architectural plan symbols. Bryant Electric Co.

Electronics

5-29. *Electronics at Work*, 42 pp., illus. A "review of electronics at work in industry." Simply, clearly presented data on uses of electronics, from power conversion to air cleaning. Westinghouse Elec. & Mfg. Co.

Elevators

5-27. *Murphy Electrical Elevators*, Murphy Elevator Co. Reviewed Jan.

Finishes

6-47. *Porcelain Enamel—Its Characteristics and Qualities*, Porcelain Enamel Institute, Inc. Reviewed Jan.

Fire Extinguishers

Cardox Corporation, reviewed January:

6-48. *Cardox Transitank Fire Extinguishing Unit.*

6-49. *Cardox Fire Trucks.*

6-50. *Cardox Airport Fire Trucks.*

6-51. *Test Data—Cardox Airport Fire Truck.*

Floors

More "idea" portfolios on store modernization, based on trade association recommendations. Armstrong Cork Company:

6-52. *Ideas for the Jeweler Who Is Planning for Tomorrow.*

6-53. *Ideas for the Baker Who Wants to Have a Better Shop.*

6-54. *Floors That Stay Young*, 6-p. illus. consumer folder on hardwood floors, factory finished, waxed, polished. E. L. Bruce Co.

6-55. *Modern Floor Finishing*, 6-p. illus. consumer folder on advantages of wood flooring surfaced with pore-penetrating finish. E. L. Bruce Co.

6-56. 4-page illustrated consumer folder on machines for cleaning mill floors. G. H. Tennant Co.

Glass

7-34. *Planning Ahead With Glass for More Enjoyable Living*, Libbey-Owens-Ford Glass Co. Price 10 cents. Reviewed Jan.

Glass Block

7-37. 4-p. illustrated folder on advantages of glass block for railroad buildings. Owens-Illinois Glass Co., Insulux Products Div.

7-38. 4-p. illustrated folder on replacement of old windows with glass block,

in industrial buildings. Owens-Illinois Glass Co., Insulux Products Div.

Granite

7-39. *Fletcher Granite Products, AIA File 8-B-3*, 4-p. illus. folder briefly describing granite masonry types. H. E. Fletcher Co.

Gypsum and Gypsum Products

7-40. *Farm Production Must Be Increased*, 8-p. illus. booklet. Brief descriptions, many photos of farm buildings constructed of gypsum fireproof products. United States Gypsum Co.

7-41. *Sheetrock, Pyrofill and Weatherwood Pyrofill Roof Construction (CD-16)*, 8-pp., illus. Advantages, construction suggestions, master specifications, details, on reinforced gypsum roof construction "poured-in-place" over permanent "Sheetrock" forms. United States Gypsum Co.

7-35. *Sheetrock Laminated Products*, United States Gypsum Co. Reviewed Jan.

7-36. *U. S. Gypsum Plank, Steel Bound, Tongued and Grooved*, United States Gypsum Co. Reviewed Jan.

Heating Equipment

8-71. *Heat Exchangers, AIA 306-1 (Bulletin H-1)*, 4-p. illus. folder on instantaneous and storage hot water generators, open and closed heat exchangers and converters. Heating capacities to 4,400 gal. per hr; storage capacities to 1,904 gal. Brownell Co.

8-72. *Byers Radiant Heating in a Garage (P.O.6741)*, 6-p. illus. folder. Case study and layout of a radiant-heat system installed in a truck parts and service building. A. M. Byers Co.

8-73. *Series 12 Unit Heaters, AIA-30-D11 (Cat. 12C-1)*, 4-p. illus. folder on industrial downblow unit heater for 20- to 45-ft. ceiling heights, capacity to 432,000 Btu. Fedders Mfg. Co., Inc., Industrial Heating Div.

8-74. *Wartime Story of a Bottling Boiler Plant*, 18-p. illus. booklet. Review of products—from tank hulls to boilers—made by a heating and air conditioning equipment supplier. Fitzgibbons Boiler Co., Inc.

Insulation

9-41. Literature on "Cemesto" insulated panels, Celotex Corp. Reviewed Jan.

9-43. *Announcing Sisalation*, folder on a new aluminum reinforced material for moistureproof barriers and reflective insulation. Sisalkraft Co.

Iron

9-42. *Wrought Iron in Refrigeration and Air-Conditioning Systems*, A. M. Byers Co. Reviewed Jan.

Kitchen Equipment, Commercial

11-08. *Preferred Heavy Duty Fuel Oil Burning Ranges (Bulletin 200A)*, 8-p. illus. booklet on types of insulated steel ranges for marine, railroad, heavy commercial cooking. Specifications, accessories. Preferred Utilities Co., Inc.

Lighting

12-53. *Germicidal Lamps (Y-560-R)*, 8-p. booklet (4x8). Statement of General Electric Co. policy and claims; educational material on and recommendations for use of germicidal lamps.

2 booklets, price schedules for large mazda lamps and G-E miniature lamps, from General Electric Co., Lamp Dept.; tax and ordering information; ratings: etc.:

12-54. *Standard Price Schedule of Large Mazda Lamps, AIA-31-F (Form 2195).*

12-55. *Standard Price Schedule of General Electric Miniature Lamps, AIA-31-F (Form 2101).*

Maintenance, Floors

Hillyard Chemical Company, reviewed January:

13-14. *Hillyard's Manual on Proper Floor Maintenance.*

13-15. *Floor Treatment and Maintenance Job Specifications.*

13-16. *Hillyard Handy Maintenance Manual.*

13-17. *Hillyard's Wartime Treatment for Gymnasium Floors.*

13-18. *Modern Floors, Their Maintenance.*

13-19. *Modern Maintenance.*

13-20. *Hillyard's Combination Basket Ball Chart and Score Book.*

Metals

13-27. *Designs in Metal*, Cincinnati Metalcrafts, Inc. Reviewed Jan.

13-28. *Rigidized Metals Engineering and Other Data*, Rigid-Tex Corporation. Reviewed Jan.

Piping

16-73. *Wrought Iron for Piping Systems*, 32-p. illus. booklet of technical data on various pipe materials, costs, selection, corrosion, conditions, specifications. A. M. Byers Co.

Plastics

16-74. 4-p. illus. folder on uses and properties of "Durez" phenolic resins: molding compounds, industrial and oil-soluble resins. Durez Plastics and Chemicals, Inc.

16-75. *Hercules Cellulose Acetate, Properties and Uses (Form 500-28)*, 36 pp., illus. Technical data on cellulose acetate flake: general and specific properties; use as solutions, laminates, plastics; charts, tables. Hercules Powder Co., Cellulose Products Dept.

Prefabrication

16-76. *The Rigidsteel Standard Building*, 8-p. folder on prefabricated structural steel rigid frame buildings; detail drawings. National Machine & Foundry Co.

Protective Coatings

16-70. *Stormtight and the ABC's of Roof Coatings*, L. Sonneborn Sons, Inc., Building Products Div. Reviewed Jan.

Pump Equipment

16-71. *Ashcroft Air Control—Shallow Well Type (7246)*, Manning, Maxwell & Moore, Inc., Electro-Mechanical Div. Reviewed Jan.

16-72. *Yeomans Type "SHB" Ball Sleeve Bearing Centrifugal Pumps, File 29d5 (Bulletin 1011)*, Yeo Bros. Co. Reviewed Jan.

Refrigeration, Industrial

18-19. *New Light on York Turbo-C pressor (Bulletin 44738)*, York C Industrial Refrigeration Dept. Revie Jan.

Steel

19-45. *Know Your Steel When Build or Remodel (PO-14)*, 20 pp. i Information for consumer on type sheet steel and its various uses i home, both as construction mate and as equipment. American Ro Mill Co.

19-46. *Jessop Stainless Steels*, 8 illus. Definitive list of hardenable st less steels, their physical fabrica properties, mechanical characteris Corrosion-resistance table; section mild steel coated with stainless. Je Steel Co.

Steel, Structural

19-41. *Fabricated Structural St* American Institute of Steel Constr tion, Inc. Reviewed Jan.

19-43. *Mahon Steel Deck (Cat. AIA File 12-C*, R. C. Mahon Co. viewed Jan.

19-44. *Truscon Steel Joists, Metal La Reinforcing, Steel Deck Roofs*, Trus Steel Co. Reviewed Jan.

Store Fronts

19-50. *The Architect and "Machines Selling!" (SF-5202)*, 14-p. illus. fol urging architects to understand m chandising problems before designi store fronts, and offering "Kawne services, methods, products, to achi this understanding. Kawneer Co.

Temperature Controls

20-21. *Electric Controls (Bulletin 2287-1)*, Barber-Colman Co. Review Jan.

Ventilation

22-11. *Put the Wind to Work (Bulle EX-101)*, 12 pp., illus. Description a wind-actuated, weatherproof "Ag tair" exhauster unit for various app cations; engineering data; accesso etc. Air Devices, Inc.

22-12. *Arex-Kernchen*, 4-p. illus. fold on roof and fan ventilators, exha fans, louvers; data tables; accessori details; specifications. Arex Co., Ker chen Co.

Waterproofing Materials

23-53. *Larson Pre-Formed Waterpro ing Units, AIA File 12-H*, Brisk Wate proofing Co., Inc. Reviewed Jan.

Windows, Wood and Metal

Mesker Brothers, reviewed January:

23-55. *Book of Apartment Windows AIA File 16e1.*

23-56. *Book of Windows for Homes.*

23-57. *Book of Windows for Offi Buildings.*

4-30. *New Comfort Thru Bishop Vent Glass Windows and Doors*, Nu-Air-W Co. See No. 4-30 under "Doors."

REVIEWS AND DIGESTS

JEAN SHORT and DAVID ALDRICH

BOOKS

Plastics, 3rd Edition, J. H. Dubois; Cloth bound, 447 pp., illus., charts, index. American Technical Society, Chicago, Ill. 1945.

Mr. Dubois writes authoritatively on the manufacture and use of more important plastic materials and products. As a handy reference book, all questions applying to plastics seem to be answered. Although the explanations of manufacturing processes are, at times, technical, illustrations, diagrams, and charts make such discussions easy to follow.

Design information giving details on mechanical and electrical phases and for general purposes and proper usage of molded plastic material should prove very useful to architects and engineers.

Pre-stressed Reinforced Concrete, *Kurt Billig. Cloth bound, 248 pp., illus. tables, charts, index, list of corrections. F. Billig, Jamaica, New York. $5.00*

The remedy for all disadvantages caused by early cracking of reinforced concrete has been known for a long time: the suppression of plastic deformation of the concrete in tension by reinforcement pre-stressed before and while the concrete is setting and released after the concrete has hardened sufficiently." A fully pre-stressed member remains in a homogeneous state under all loads provided for by the design; the compression flange of a beam extends deep down toward the bottom of the section. Thus the concrete stresses are more evenly distributed and the maximum value of the concrete compression in a highly pre-stressed beam is much lower than for a beam with low pre-stresses or with none at all. The concrete section of fully pre-stressed beams may be reduced without reducing their load-bearing capacity. This produces a radical change in structures in which the dead load outweighs the live load as in bridges and similar girders of large span. Here, with the application of high preliminary stresses, the reduction in dead weight may be very substantial and may allow for a corresponding increase in live loads or—what is usually of greater importance—for an increase in span, for a wider spacing of supports. Because of the comparatively small increase in the stress of a highly pre-stressed reinforcement upon application of live load, deformations of the structure as a whole are small under live loads; deflections are only a small portion of those occurring under similar loads in ordinary reinforced concrete structures. All the deformations caused by loads not exceeding the design allowable load are entirely elastic. Therefore cracking can be completely avoided under the design loads. This means a great improvement in reinforced concrete as a building material for certain purposes. So, for instance, reinforced concrete tanks and containers may be made completely watertight by the pre-stressing process. The permanent compression of the concrete guarantees greater durability, lower costs of maintenance, and improved appearance.

Although an increasing number of articles is being published about P.R.C., there has been, to date, no summary or general text. Mr. Billig feels that the principles, methods, and details of actual structures in P.R.C. are not widely known in the engineering profession and that existing publications dealing with the subject are very scanty in their treatment of design. Mr. Billig's book is written to remedy that deficiency. *Pre-Stressed Reinforced Concrete* deals with the theory, practice, and actual design of pre-stressed reinforced concrete structures. The first of two parts present general information, discussing the development of various pre-stressing methods and summarizing the application of preliminary stresses. The second part shows in simple lines the derivation of formulae which permit the complete design of P.R.C. structures. Because of the homogeneous behaviour of P.R.C. structures under permissible loads, the design of such structures is much simpler than that of ordinary reinforced concrete calculated in accordance with conventional methods. To simplify the work of the designer, many tables have been prepared and the characteristics of a set of P.R.C. I-beams are given in a group of tables. To illustrate the text the entire design of a pre-cast P.R.C. I-beam has been calculated by both approximate and accurate methods with a thorough discussion of intermediate results.

Mr. Billig's text enables any engineer familiar with reinforced concrete construction to take advantage of the higher qualities and increased capabilities of resistance of the material which are obtained by its preliminary stressing.

PAMPHLETS, MANUALS

I.B.R. Testing and Rating Code for Low Pressure Heating Boilers, *3rd Edition. July 1945. Institute of Boiler and Radiator Manufacturers, 60 E. 42 St., New York, N. Y. Paper bound, 73 pp., illus., charts, tables, diagrams. $1.00*

The purpose of the Code is to provide a reliable, uniform procedure for measuring the performance of all low-pressure heating boilers. The code is divided into four parts: rating of boilers; testing of hand-fired boilers; procedure for obtaining I-B-R ratings. These topics are amplified and illustrated by tables, charts, typical testing setups, and step-by-step computation guides.

Copper Batten Type Roofs, *Monograph III. Copper and Brass Research Association, 420 Lexington Ave., New York, N. Y. August 1945. 6 pp., folded paper pamphlet, illustrated. Free.*

This monograph describes methods of applying copper to the roofs of residences, cathedrals, and public buildings using batten construction. Descriptions and illustrations show construction details for plane, convex, concave, and domed roofs and their intersections.

Fuels and Burners for Domestic Heating. *8 pp., pamphlet, illus., charts. Small Homes Council, University of Illinois, Mumford House, Urbana, Ill.*

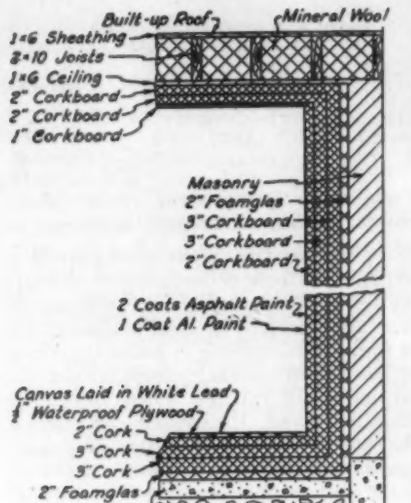
This is another pamphlet in the series published by the University of Illinois for home owners and prospective builders. In non-technical language, types of coal, oil, and gas burners are discussed and amply illustrated by examples and comparative-cost charts. The bulletin covers hand-fired coal or coke burners, automatic stokers, gas-fired equipment, pressure, rotary, and vaporizing oil burners.

Stairs, Railings, Part III, *Products. Preprint from Architectural Metal Handbook (A.I.A. File No. 14-D). National Association of Ornamental Metal Manufacturers, Dept. P, 209 Cedar Avenue, Takoma Park, Washington 12, D. C. 1945. 32 pp., illus.*

Part of a handbook being prepared for general enlightenment and guidance toward uniform standards, this section concentrates on methods of metal stair and railing construction. Each type of stair is introduced with detail drawings accompanied by brief text and specifications, followed by data on newels, string sections, treads and risers, stairwell dimensions, etc. One page is given to allowable uniform loads in kips and deflections in inches for stair strings.

The second part of the guide deals with stair railings—ornamental, tube, welded pipe (and fittings), and bridge.

Available with the booklet are enlarged detailed drawings for use on the drawing board.



Details of construction of the "Climatometer." From *Heating and Ventilating*, Sept. 1945.

TECHNICAL ARTICLES

The Climatometer—All-Weather Room. *F. G. Hechler, Director, Engineering Experiment Station, Pennsylvania State College.* Heating and Ventilating, *September, 1945.*

The performance of building materials, standard and substitute, is being examined in a Government-sponsored all-weather room at Pennsylvania State College. Weather conditions from the tropics to the poles, including rain and sandstorms, can be reproduced. The Climatometer was built as an addition to the existing Heat Transfer Laboratory which has complete facilities for making heat transmission tests by the accepted guarded-hot-plate and hot-box methods for mean temperatures from 25 to 1,000°F.

The inside dimensions of the Climatometer, adequate to accommodate a small test house, are 24′ x 29′, with a 17′ ceiling. The range of temperatures and humidities imposes severe stresses on the insulation (due to alternate expansion and contraction and possible accumulation of moisture). All board insulation was dipped in hot asphalt before erection; wooden pegs were used for securing the inside layer of corkboard; the usual asphalt emulsion inside finish was omitted because the difference in expansion between corkboard and asphalt causes serious cracking in large wall areas when the temperature range is great. Inside surface finish consists of two sprayed coats of asphalt and a final coat of aluminum paint. Plywood-and-canvas flooring was used instead of concrete to reduce heat capacity.

To date, only Navy materials have been tested by the engineers at the College; peacetime structural systems will soon be analyzed.

The Solar House, A Full Scale Experimental Study. *F. W. Hutchinson, Prof. of Mech. Engineering, Purdue University.* Heating and Ventilating, *September, 1945.*

The incredible number and range of claims advanced concerning the solar house have led the Purdue Research Foundation to undertake an extensive theoretical and experimental study. The intent of the project is to establish, by means of an analytical heat balance procedure, a rational theory applicable to the thermal problems of solar construction; one from which the engineer or architect can deduce with adequate accuracy the advantage or disadvantage of using the large glass areas typical of solar construction. Factors such as transmissivity of glass, as well as absorptivity and reflectivity, are, of course, determined partly by geographical locations and climate. These, and many others, such as wind velocity, type of glass, thermal conductance of exterior walls of the structure, etc., must be considered in setting up a general procedure for thermally evaluating the solar house.

Concurrent with the theoretical investigation, a "laboratory" study based on two full-scale test houses is in progress. The two are of identical plan and construction except for ⅔ glass area on the southern exposure of one. This winter the houses will be electrically heated; cost will be compared for maintaining in both conditions of equal comfort. Such a comparison will take into account the difference in mean radiant temperature needed due to the difference in inside surface temperatures.

The program has as its sole objective the determination of sound, accurate engineering data, from which adequate design procedure can be established as well as a simple method for evaluating the thermal dividend gained by solar design.

Kitchen Planning, *British Commercial Gas Association, 1 Grosvenor Place, London, S. W. 1. 64 pp., illus. 60 cents.*

Joint research by the gas industry and Jane B. Drew has resulted in a brochure of new plans for British kitchens. Sections dealing with equipment (unit cupboards, etc.), fuel service (gas, of course), plumbing, color, ventilation, and lighting are included in the booklet. Its most novel contribution is a chapter on the sizes of various objects used or stored in the kitchen, well illustrated with storage arrangements. Also included are six proposed kitchen designs including a "package kitchen" and kitchen-bathroom units.

Prestretched Reinforcing Makes Concrete Beams Stronger. *Engineering-News Record, August 23, 1945.*

B. J. Lambert and Ned L. Ashton, professor and assistant professor of civil engineering in the Materials Test Laboratory of Iowa State University College of Engineering, are carrying on a series of experiments on pre-stretched reinforcing bars. Commercial reinforcing bars are stretched about 10% and released before placing in the concrete. Beams tested have a constant width of 6", a length of 72" and nominal depths of 4", 6", and 8".

In the first tests, 28 beams, using two types of bars, were made. Each beam was reinforced with a set of 3 similar standard end-hooked bars wired together and placed 1" from the bottom on metal stools. Half the standard commercial type bars were placed in the tension machine for stretching, the other half used as in normal practice.

The stretched bars, 10% longer than normal lengths, were cut to size, standard hooks were formed on the ends, and sets of 3 were made up as for ordinary rods.

Heating and Ventilating Reference Data. *Water Piping Demand I, September, 1945. Industrial Press, 148 Lafayette St., New York, N. Y. 30 cents.*

This sheet (together with Reference Data 303-4) is a condensation of a method developed by the National Bureau of Standards for determining water supply pipe sizes for residential buildings.

The method has utilized probability theories to estimate maximum demands of multi-fixture water supply systems. The estimates are presented as curves by which one may determine estimated maximum demands for systems utilizing up to 500 G.P.M. Another chart determines pressure loss in disc-type water meters. Step-by-step application of this data for the determination of pipe sizes appears on Reference Data 303-4 which will appear in the next issue of *Heating and Ventilating.*

Seeing in the School House. *William G. Darley,* School Board Journal, *September, 1945.*

Discussing factors influencing seeing, Mr. Darley lists as most important: size of object being viewed; revealing brightness contrast between the object and its immediate background; reflectability of material; time allowed for seeing; brightness of task; disturbing brightness ratio between task and surroundings; acuity of eye; eyeglasses. Low brightness ratios between the work and other surfaces are considered an aid to seeing, although attainment of such a relationship seems too expensive to be practical. Pointing out the right of every pupil who needs them to have eyeglasses, Mr. Darley recommends special lighting treatment be provided for those students for whom glasses do not give "normal" vision. Properly printed books should be standard schoolhouse equipment and regularly spaced vision tests should be planned in order to keep the standard of schoolhouse seeing at a satisfactory level.

. THERE MUST E A REASON!

FOR VETERANS

, it's not a cuss word, that *HH*, but the designation of a priority on building materials, reserved for veterans o are building houses—or so the everpresent "they" say. t there's a lot more in the new, unpronounceable dipthong in that. Some weeks ago, when the expected housing ortage became so acute that ground hogs and Congressmen d to recognize it, Reconversion Director John W. Snyder oposed use of priority controls on materials, accelerated ease of surplus war housing, and ceiling prices on sales housing. The President approved, and commencing nuary 16, 1946, a portion of the total supply of each of ten ential building materials is allocated "to veterans." That the public impression, but it probably won't work out so ply. It never does, even when the regulation has less vious loopholes than this one.

e HH priority is on a different basis than the old WPB der L41, which restricted construction, and which was olished last October 15. The new order permits any kind construction to proceed—Loophole No. 1. It does a ocate terials; but to whom? To individuals or organizations nstructing housing which veterans will be given first eference to buy or rent. It will be granted only if the ntemplated housing will be offered to veterans for 30 days r sale at less than $10,000, or will be made available for days to veterans for rental at $80 monthly, or less; or if e builder is a veteran building his own house at a total cost less than $10,000 including land—lots of loopholes! How ny veterans can afford $10,000 houses? Or $80 rents? hat's the profit to the builder on a $10,000 house compared a $7,000 or $8,000 house? So, what price house is the ilder going to concentrate on?

he order allocates only ten building materials—brick, clay wer tile, structural tile, gypsum board, gypsum lath, cast on-soil pipe, radiators, bathtubs, lumber, and millwork—amounts ranging from 1% to 50% (69% of iron radiators) total production. At present this is a fallacious list; in ost parts of the country such items as hardware, heating uipment, concrete block, plumbing and electrical supplies e just as tight. Try and buy any quantity! But we do ar that such materials may shortly be added to the list.

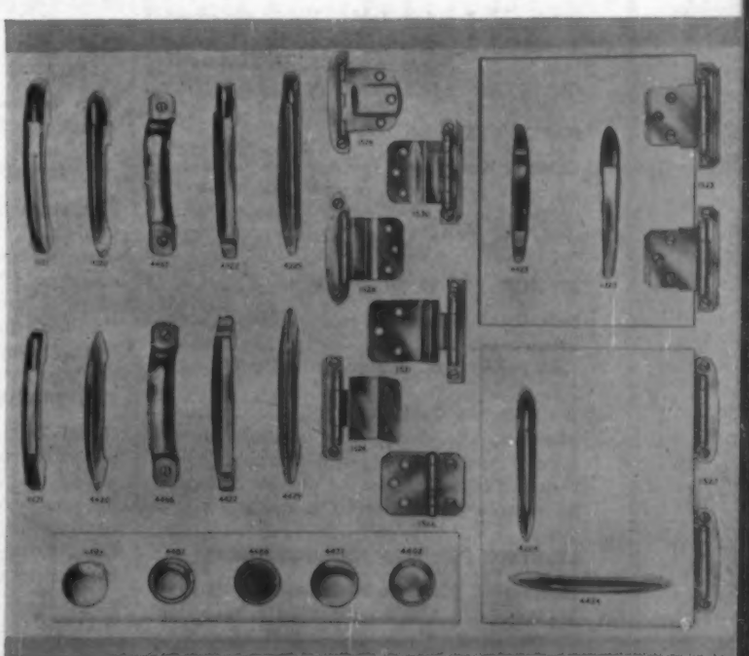
here are other conditions. If you're interested, you can d out about them from your local FHA office, where iorities will be issued. A special application form CPA 86 is necessary, and that, too, will probably become a word. FHA plans to promote the considerably-less-than-0,000 house, but will have to rely on moral suasion. The merican Bankers Association plans to help by distributing pplication blanks and a digest of the rules. Sounds like the tle of a song: *You Restrict 'Em, Deqrie, While We Promote Loan.*

UT YOU CAN'T KEEP 'EM DOWN

he Bakelite Corporation announces a new type of laminating lastic known as the C-5 resins, of which the first is designed pecifically as a surfacing material and is named Bakelite -5 Laminating Resin XJ-17694. Now get up off the floor nd we'll tell you what it does. It's available in practically l colors, has high gloss, is quite flexible yet very hard, is ighly scratch- and mar-resistant, chemically resistant, al-ost craze-proof, and resists stains and electrical arcs. Well!

nd although United Wallpaper, Inc., doesn't say so, plastics ust have something to do with a new wall covering, Varlon, hich Varlon, Inc. (a subsidiary of United Wallpaper—don't et confused) will market. "They" do say it's completely

"Plastipitch," a new roofing and siding material, is protected metal with a permanently adhering surfacing which renders the material highly corrosion, chemical, and heat-resistant, and eliminates cost of painting and replacement due to deterioration. The treated sheets can be bent and fabricated without harm; they are tough and elastic. Manufacturer is Koppers Co., Tar and Chemical Division, Pittsburgh.



Stanley Works' line of postwar cabinet hardware is called "jewel-like" by its manufacturers, is designed with much emphasis on modern "styling," wide range of prices—and, of course, the hardware probably does its job quite well.

General Electric's "Select - O - Switch" clock, the control device for gadgets discussed in the text.

stain-proof; that almost any type of dirt, grease, or stain can be washed off it with soap and water. That great educator of the masses, *Life* magazine, ran a whole series of pictures on it recently.

FOR THE GADGET ERA

Ever stop to think how many mechanical household devices are available? If they continue to multiply, and if there's anything in the theory of the influence of environment on the human form, maybe our heirs will have fewer of certain brain-cells, fewer fingers, maybe no hands. Interesting prospect—but a little off the subject. It seems we're now going to be able to operate all these gadgets by automatic electric clock, and simultaneously, too. You plug the clock in, connect the appliance to the clock, fiddle with the selection keys, and just as you're wondering if the dang thing works, bathroom heater heats, the radio tunes in, the perco perks, the toaster toasts. And they all turn themselves permanently until you fiddle with the keys again. Ge Electric (Bridgeport, Conn.) calls the clock the "Select Switch," says it will sell for $9.95 when April comes, and encased the completely automatic, self-winding, sealed- clockworks in a case of "mottled chestnut plastic;" but don't seem to think that treating modern plastic like an mottled wood makes their product an anachronometer. do we know when someone will announce a gadget to co the gadget-control, or whether Shaw, Karel Capek, or J Verne is doing a play on the theme.

IMPORTANT (WE HOPE) NOTES

National Lumber Manufacturers' Association announces the U. S. Army, Corps of Engineers, will henceforth a by National Design Specifications, somewhat liberalized, all timber construction; which is pulling some good out the war. . . . Anderson Corporation announces a new dou hung window unit with removable sash, pressure-seal we erstripping, no weights or counterbalances, semi-assem frame which will often require no additional trim. It wil available, with either divided lights or horizontal bars, s time this Spring. . . . Briggs Manufacturing Co. says the redesigning their "Beautyware" line, but they can't go i much detail yet. . . . Isn't it exciting?

THIS MONTH'S PRODUCTS

CONCRETE FORMS

Formfilm. Protective coating for fibrous wood forms for concrete; produces smooth surface free from grain markings. A. C. Horn Co., 43-36 Tenth St., Long Island City 1, N. Y.

DRAFTING ROOM EQUIPMENT

No. 3583 Drafting Pencil. Refillable; knurled finger grip; rubber grip to hold lead reduces breakage. Charles Bruning Co., Inc., 4654-8 Montrose Ave., Chicago 41, Ill.

Work and Drafting Table. Height-and-angle adjustable, tilt-top; storage for 3 extra boards; 3 drawers. Work-Flow Equipment Co., 207 Wood St., Pittsburgh 21, Pa.

HARDWARE

Cabinet Hardware. Postwar line of metal latch-pull sets, knobs, hinges for drawers or doors. The Stanley Works, Cabinet Hardware Div., New Britain, Conn.

KITCHEN EQUIPMENT

Sink Unit. Standard Crane sink with base cabinets on either side. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.

Wall Kitchen Cabinets. 1946 steel cabinets coordinated in design with electrical appliances; installable on metal hangers. Interchangeable accessories for drawer and cupboard cabinets. General Electric Co.

LIGHTING FIXTURES AND EQUIPMENT

Fluorescent Commercial Luminaire (Model 3011). 2- and 4-light with metal louvers, for higher lighting levels. Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago 14, Ill.

Heat-Ray Lamp. 250-watt infrared heat-ray lamp, resistant to breakage from cold water spray shock, for household spot heating, drying, therapeutics. Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.

PAINT, INSECTICIDE

Superior 365. Wall paint mix containing DDT for "insect control." Recommended for structures requiring sanitary protection. Superior Paint and Varnish Co., Chicago, Ill.

PLUMBING EQUIPMENT

Drainage Fittings. New drainage fittings to fit all wall hung closet bowls; non-corrosive; recessed lead gasket. Hub-and-spigot or I.P.S. types. J. A. Zurn Mfg. Co., 1800 Pittsburgh Ave., Erie, Pa.

Soap Dispenser. streamlined, plastic, individual. U. S. Sanitary Corp., Chicago, Ill.

PROTECTED METAL

Plastipitch. Steel sheets (for industrial roofing, siding, flashing, etc.) treated with a protective compound against rust, corrosion, salt air, chemical fumes; can be bent and fabricated without damage to coating. Koppers Co., Inc., Tar and Chemical Div., Koppers Bldg., Pittsburgh, Pa.

TEMPERATURE CONTROL

Model TS-1. Thermostatic expansion valve regulates refrigerant flow into commercial evaporator; eliminates need of special charging and external equalizer. Tenney Engineering, Inc., 26 Avenue B, Newark 5, N. J. (The above announcement was incorrectly credited in the December issue.)

VALVES

4-Way Hydraulic Valve. Floating piston for good sealing. Standard, spring return, spring-centered, ball detent actions; operable by hand, foot, cam, solenoid, oil or air pressure. Gerotor May Corp., Logansport, Ind.

Air Reducing Valve, Class L-1A. For p sures up to 400, reduced pressures 5 to psi; stable under all conditions; instant action to widest and sudden load variati Leslie Co., 58 Delafield Ave., Lyndhurst,

VITREOUS COATING

Tite-Wite. Opaque, thin white porcelain amel cover coat, regular and acid-resist applicable for many uses where usual po lain is too heavy. O. Hommel Co., Pittsbu Pa.

WATERPROOFING

Quick-Set. Powder mix sealant for maso walls or floors, for tightening bolts in crete. Said to set under water and expa water pressure in 3 to 5 minutes. Ameri Fluresit Co., Inc., 635 Rockdale Ave., C cinnati 29, Ohio.

Tricoseal. Slow-hardening powder compo for damp-and-moisture protection and de rating of dense, hard, smooth maso American Fluresit Co., Inc.

Flureseal. Heavy-duty, water-and-dam resistant, and decorating compound for p ous masonry. American Fluresit Co., Inc.

Ranetite No. V Transparent Waterproo Improved, transparent, water-and-damp-re tant coating for masonry which has no p vious paint or oil coating. Destroys alk deposit, does not discolor. Ranetite Mfg. C Inc., 1917 S. Broadway, St. Louis 4, Mo.

WINDOWS

Pressure Seal Window Unit. Double h wood unit featuring removable sash; ma factured complete with weatherstripping operating mechanism; frame semi-assembl easy installation. Andersen Corp., Bay Minn.

PLYWOOD: III (Physical Characteristics)

BUILDING PRODUCTS FACTS
Progressive Architecture • February 1946 • Serial No. 19

This is the third of a series of Building Product Fact Sheets on Plywood. Sheets I and II, published in November and December 1945, contained information on manufacture and grades available, as well as sources of supply, of Douglas fir, hardwood, plastic-surfaced, and metal-surfaced plywood.

DOUGLAS FIR PLYWOOD

SIZES IN INCHES Grade	Trade Name	Widths	Lengths	Thicknesses
Standard Panels	"Plypanel"	24, 30, 36, 48	60, 72, 84, 96	3-ply: 3/16, 1/4, 3/8 5-ply: 1/2, 5/8, 3/4
Wallboard	"Plywall"	48	60, 72, 84, 96	3-ply: 1/4, 3/8 5-ply: 1/2
Sheathing	"Plyscord"	36, 48	96	3-ply: 5/16, 3/8 3 or 5-ply: 1/2, 5/8
Industrial	———	up to 48	up to 96	3-ply: 1/4, 5/16, 3/8 5-ply: 1/2, 9/16, 5/8, 11/16, 3/4, 7/8 7-ply: 7/8
Concrete-form	"Plyform"	36, 48	60, 72, 84, 96	3-ply: 1/4 5-ply: 1/2, 9/16, 5/8, 3/4
Door Panels	———	As ordered	As ordered	3-ply: 1/4
Exterior	"EXT-DFPA"	From 12" increasing by 2" units to 30"; also 36, 42, 48; **except** ext. sheathing only 48" wide.	48, 60, 72, 84, 96 **except** sheathing only 96" long	3/16, increasing by **1/16 to 1-3/16, except ext.** sheathing only **5/16**, 3/8, 1/2, 5/8; and concrete form only 5/8, 3/4

ROOF SHEATHING

Recommended Thicknesses (Douglas Fir Plywood Assn.) Panels lengthwise across rafters

Roof Load lb. per sq. ft.	Rafter Spacing, Inches	Thickness Inches
20	20	5/16
	24	3/8
	30	1/2
	36	5/8
30	17-1/2	5/16
	21	3/8
	26	1/2
	33	5/8
40	16	5/16
	19	3/8
	24	1/2
	29-1/2	5/8

BENDING—Min. Radii to which D. F. plywood can be bent

Thickness, Direction of Grain	Radius (inches)
1/4-in. lengthwise	24
1/4-in. crosswise	15
3/8-in. lengthwise	54
3/8-in. crosswise	36
1/2-in. lengthwise	8 ft.
1/2-in. crosswise	6 ft.
5/8-in. lengthwise	10 ft.
5/8-in. crosswise	8 ft.
3/4-in. lengthwise	12 ft.
3/4-in. crosswise	10 ft.

ACOUSTICAL PROPERTIES

Sound Transmission—Loss in decibels

Single sheet, 1/4" 3-ply	22.4	(National Bureau of Standards)
Partition, 1/4" 3-ply, on 2" x 4" studs 16" o.c.	31.1	(Riverbank Labs., Geneva, Ill.)

Sound Absorption Coefficients (Riverbank Labs.)

Material	Frequency Cycles 128	256	512	1024	2048	Avg.
1/4" fir plywood, 2 sides of 2" x 4" studs	.31	.11	.14	.12	.10	.16
Same, but with 3/4 lb. felt and wallpaper both sides	.35	.18	.16	.11	.13	.19

VAPOR TRANSMISSION (Tests at U. S. Forest Products Lab.)

Material	Loss in Grains per sq. ft. per hr.
1/4" fir plywood, 3-ply, 2 coats asphalt paint	0.308
1/2" fir plywood, 5 ply	1.929 to 1.975
1/4" fir plywood, soybean glue, plain	3.920 to 4.620

Note: The lower the figure in the "Loss" column, the more satisfactory the vapor barrier. Aluminum paint, if available, will work as well as asphalt paint. Limited experience indicates vapor loss should not exceed 0.60 to 1.00 grains per sq. ft. per hr., under pressure 18.45 mm. Hg.

NAIL-BEARING STRENGTH

Maximum Ult. Loads, Fir Plywood Nailed to 1-5/8" Fir Framing

Plywood Thicknesses	NAIL SIZE 6d Com. Load	6d Com. Plywood Edge Distance	8d Com. Load	8d Com. Plywood Edge Distance	10d Com. Load	10d Com. Plywood Edge Distance	16d Com. Load	16d Com. Plywood Edge Distance
5/16"	275#	3/8"	305#	3/8"				
3/8"	275#	3/8"	340#	3/8"				
1/2"			350#	3/8"	425#	3/8"		
5/8"			350#	3/8"	425#	3/8"	445#	3/8"
3/4"					410#	3/8"	445#	3/8"

Values are average ultimate based on 650 tests of standard commercial panels, nailed with edge of panel at center line of 1⅝" Douglas fir studs. Any change in edge-distance, therefore will decrease load. Values average about 25% higher when panels are nailed to 2⅝" studs with 6d common nails, and 40% higher where larger size nails are used. A proper factor of safety should be applied.

PLYWOOD: III (cont'd.)

HARDWOOD PLYWOOD

SIZES are given in B.P.F. sheet "Plywood I" Serial No. 17, November 1945. STRENGTH and other properties may be obtained from accompanying tables.

TENSILE STRENGTH OF PLYWOOD AND VENEER (Data by U. S. Forest Products Lab.)

Species	Moisture at test	Specific gravity[1] of plywood	Tensile Strength[2] of three-ply wood parallel to grain of faces	Tensile Strength[3] of single-ply veneer—1-1/2 X (c)
	% (a)	(b)	lb per sq in (c)	lb per sq in (d)
Ash, black	9.1	0.49	6,180	9,270
Ash, commercial white	10.2	.60	6,150	9,760
Basswood	9.2	.42	6,880	10,320
Beech	8.6	.67	13,000	19,500
Birch, yellow	8.5	.67	13,210	19,820
Cedar, Spanish	13.3	.41	5,200	7,800
Cherry	9.1	.56	8,460	12,690
Chestnut	11.7	.43	4,430	6,640
Cottonwood	8.8	.46	7,280	10,920
Cypress, southern	8.0	.45	6,160	9,240
Douglas fir	8.6	.48	6,180	9,270
Elm, rock	9.4	.62	8,440	12,660
Elm, American (soft)	8.9	.52	5,860	8,790
Fir, true	8.5	.40	5,670	8,510
Gum	10.6	.54	6,960	10,440
Gum, tupelo	10.3	.50	6,260	9,390
Gum, red	8.7	.54	7,850	11,780
Hackberry	10.2	.54	6,920	10,380
Hemlock, western (West Coast)	9.7	.47	6,800	10,200
Magnolia	8.8	.58	9,220	13,830
"Mahogany, African"	12.7	.52	5,370	8,060
"Mahogany, Philippine"	10.7	.53	10,670	16,000
Mahogany, true	11.4	.48	6,390	9,580
Maple, soft	8.9	.57	8,180	12,270
Maple, hard	8.0	.68	10,190	15,290
Oak, commercial red	9.3	.59	5,480	8,220
Oak, commercial white	9.5	.64	6,730	10,100
Pine, sugar	8.0	.42	5,530	8,300
Pine, northern white	5.4	.42	5,720	8,580
Redwood	9.7	.42	4,770	7,160
Spruce, Sitka	8.3	.42	5,650	8,480
Sycamore	9.2	.56	8,030	12,040
Walnut, black	9.1	.59	8,250	12,380
Yellow poplar	9.4	.50	7,390	11,080
Yucca species	7.3	.49	2,210	3,320

Note: Sample Computation—*To obtain the tensile strength of three-ply wood consisting of two 1/20-inch birch faces and a 1/16-inch basswood core: Parallel to face grain = 2 x 1/20 x 19,820 = 1,982 pounds per inch of width perpendicular to face grain = 1 x 1/16 x 10,320 = 645 pounds per inch of width. This computation neglects the tensile strength of the ply or plies perpendicular to the grain, which is comparatively small, and the results are therefore slightly in error.*

[1] *Specific gravity based on oven-dry weight and volume at test.* [2] *Based on total cross-sectional area.*

[3] *Based on assumption that center-ply carries no load. Data based on tests of three-ply panels with all plies in any one panel same thickness and species.*

STRENGTH of Various Species of Three-Ply Panels (Data by U. S. Forest Products Lab.)

Note: All plies in any one panel were of the same thickness and of the same species—grain of successive plies at right angles. In most cases 8 thicknesses of plywood, ranging from 3/30 to 3/6 inch were tested.

Species	Avg. sp. grav. based on oven-dry wght. and volume at test	Avg. moisture %	Column Bending: Column-bending modulus Parallel[1] lb per sq in	Column-bending modulus Perpendicular[1] lb per sq in	Modulus of elasticity Parallel 1000 lb	Modulus of elasticity Perpendicular sq in	Tensile Strength Parallel lb per sq in	Tensile Strength Perpendicular lb per sq in	Splitting Resistance % of birch[2]
Ash, black	0.49	9.1	7,760	1,770	1,070	96	6,180	3,940	73
Ash, commercial white	.60	10.2	9,930	2,620	1,420	143	6,510	4,350	71
Basswood	.42	9.2	7,120	1,670	1,210	85	6,880	4,300	63
Beech	.67	8.6	15,390	2,950	2,150	167	13,000	7,290	94
Birch, yellow	.67	8.5	16,000	3,200	2,260	197	13,210	7,700	100
Cedar, Spanish	.41	13.3	6,460	1,480	1,030	84	5,200	3,340	60
Cherry	.56	9.1	12,260	2,620	1,630	152	8,460	5,920	80
Chestnut	.43	11.7	5,160	1,110	740	75	4,430	2,600	74
Cottonwood	.46	8.8	8,460	1,870	1,440	109	7,280	4,240	85
Cypress, southern	.45	8.0	8,890	1,850	1,220	95	6,160	3,980	49
Douglas fir	.48	8.6	9,340	1,940	1,530	126	6,180	3,910	63
Elm, rock	.62	9.4	12,710	2,500	1,980	136	8,440	5,500	99
Elm, American (soft)	.52	8.9	8,680	1,970	1,220	109	5,860	3,990	75
Fir, true	.40	8.5	9,200	1,811	1,580	100	5,670	3,770	60
Gum	.54	10.6	8,090	1,920	1,280	113	6,960	4,320	55
Gum, tupelo	.50	10.3	7,760	1,580	1,300	111	6,260	3,760	60
Gum, red	.54	8.7	9,970	2,070	1,590	120	7,850	4,930	80
Hackberry	.54	10.2	8,100	1,880	1,150	99	6,920	4,020	84
Hemlock, western (West Coast)	.47	9.7	9,250	1,960	1,580	112	6,800	4,580	63
Mahogany, true	.48	11.4	8,500	1,940	1,250	117	6,390	3,780	—
Maple, soft	.57	8.9	11,540	2,420	1,750	145	8,180	5,380	106
Maple, hard	.68	8.0	15,600	3,340	2,110	189	10,190	6,530	114
Oak, commercial red	.59	9.3	8,500	2,070	1,290	120	5,480	3,610	70
Oak, commercial white	.64	9.5	10,490	2,310	1,340	118	6,730	4,200	85
Pine, sugar	.42	9.4	8,050	1,670	1,310	90	5,430	3,690	47
Pine, northern white	.42	5.4	10,130	2,050	1,570	111	5,720	3,340	31
Redwood	.42	9.7	8,230	1,550	1,180	108	4,770	2,960	48
Spruce, Sitka	.42	8.3	7,710	1,690	1,370	105	5,650	3,410	78
Sycamore	.56	9.2	11,040	2,340	1,630	130	8,030	5,220	77
Walnut, black	.59	9.1	12,660	2,770	1,740	141	8,250	5,260	77
Yellow poplar	.50	9.4	8,860	1,920	1,540	115	7,390	4,720	51
Yucca species	.49	7.3	2,960	900	560	44	2,210	1,700	14

Note: In some of the species listed above the tests are rather limited in number. Since there is considerable variation in the strength of wood, further tests on additional material would be expected to modify the values appreciably in some cases.

[1] *Parallel and perpendicular refer to the direction of the grain of the faces relative to the direction of the application of the force.*

[2] *The relative splitting resistance of the various panels tested depends largely on the holding strength of glue.*

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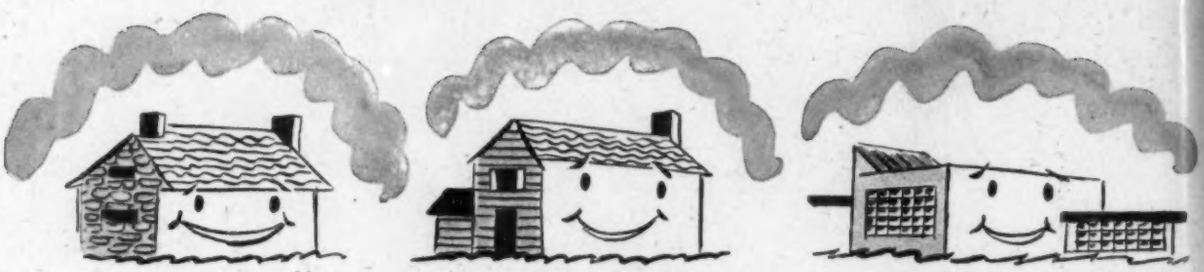

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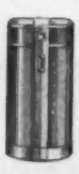

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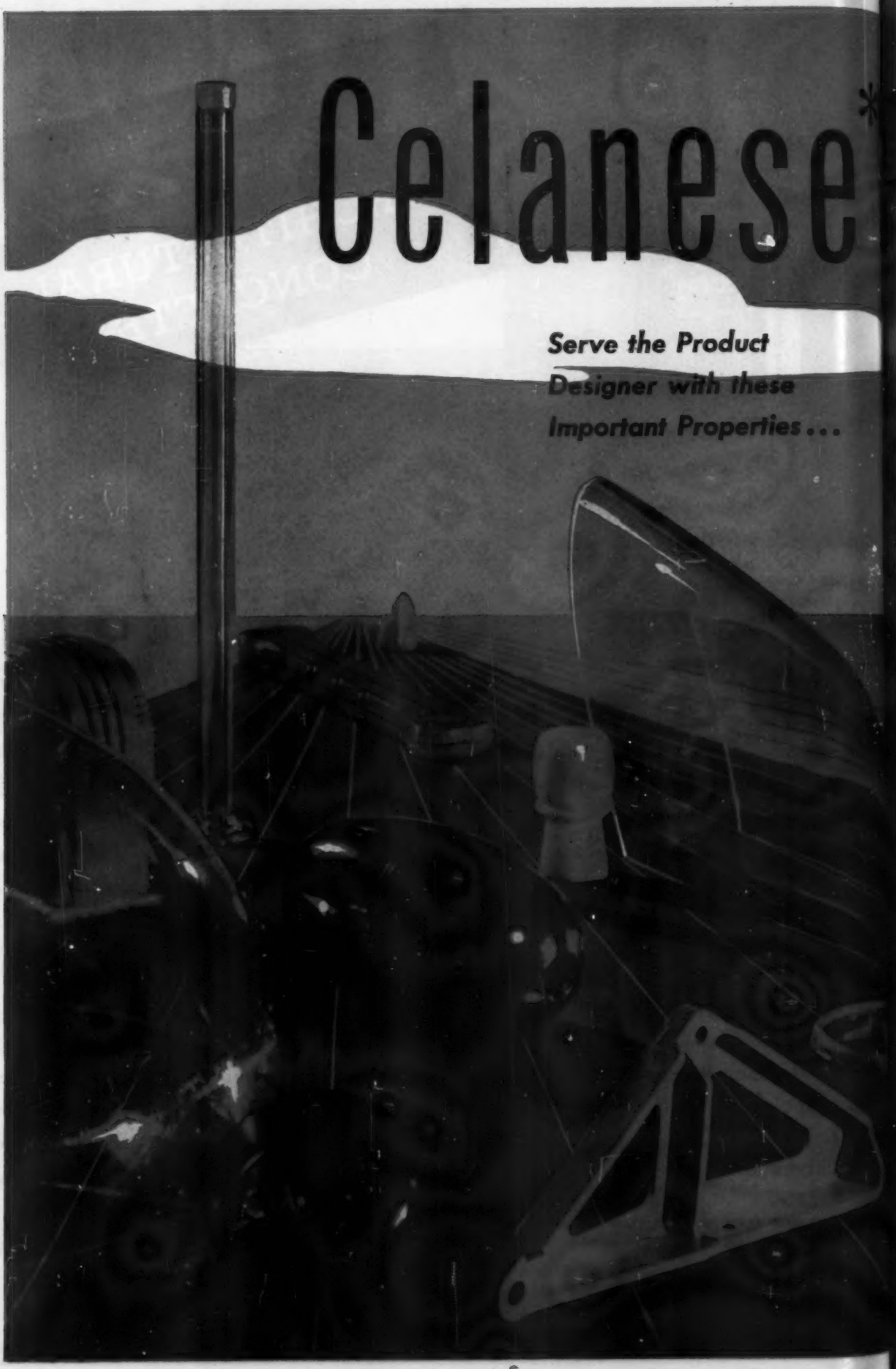
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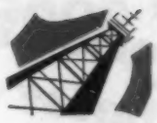

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REVIEWS ARCHITECTURAL BIBLIOGRAPHY, 194

The paper shortage during the war years limited the number of books from which this bibliography could be compiled. Below are those published or reissued since 1941 which seem likely to interest a contemporary designer.

Although the "Planning Bibliography" in the January issue covered American publications only, a few foreign volumes are included here, where they fill a particular need. No periodicals or pamphlets (other than the Revere series) are included. The Current Data Sheets compiled by Miss Ruth V. Cook, architectural librarian of Harvard University were of inestimable help in this compilation as was Miss Cook's personal aid.

I confess I believe bound volumes of "The Architectural Review," England's unique and excellent monthly, would serve in the place of almost all books on the list below. But the assignment was for a bibliography. W.S.

By WILLIAM SMULL

PHILOSOPHY

Giedion, Siegfried. SPACE, TIME AND [illegible] TECTURE. (Cambridge, Mass.: Harvard [illegible] Press, 1943. 601 pp.) An historical approach [illegible] contemporary architecture and city planning [illegible] nificent coordination of text and pictures to [illegible] the creation of new traditions.

Kepes, Gyorgy. LANGUAGE OF VISION. [illegible] troductory essays by S. Giedion and S. L. H[illegible] (Chicago: Paul Theobald, 1944. 228 pp.) [illegible] Modern visual design explored and explain[illegible] long needed book on contemporary art with [illegible] erable value for the architect and interior d[illegible]

Mendelsohn, Eric. THREE LECTURES [illegible] ARCHITECTURE. (Berkeley and Los Angeles: [illegible] versity of California Press, 1944. 49 pp.) [illegible] tionalist's discussion of architecture related to [illegible] esthetic media. Inspiring and valuable to the [illegible] signer and the layman anxious for a rational [illegible] ciation of contemporary trends.

Robertson, Howard. ARCHITECTURE [illegible] ING. (London: Faber and Faber, 1944. 125 pp.) [illegible] unusual approach toward current architectural [illegible] sign's muddle; Robertson emphasizes the open [illegible] freedom from clichés and respect for healthy [illegible] tionalism. Clear British thinking.

HISTORY

Ericsson, Henry. SIXTY YEARS A BUIL[illegible] An Autobiography. Written in collaboration [illegible] Lewis E. Meyers. (Chicago: A. Krock and [illegible] 1943. 388 pp.) Chattily recreates the building [illegible] in which Sullivan, Root, and Jenney worked. [illegible] contractor's viewpoint emphasizes a seldom [illegible] aspect of architecture; the book is innocent [illegible] esthetic bias.

Fletcher, Sir Bannister. HISTORY OF ARC[illegible] ITECTURE ON THE COMPARATIVE METH[illegible] (New York: Charles Scribner's Sons, 1943. 1[illegible] 12th edition.) A mammoth volume with [illegible] facts, pictures, and plans. Of slight value, the [illegible] on the past 200 years. Latest edition has the [illegible] British bias.

Hamlin, Talbot. GREEK REVIVAL ARC[illegible] TECTURE IN AMERICA. Periodical bibliog[illegible] prior to 1850 by S. H. J. S. Hamlin. Introduc[illegible] by Dean Leopold Arnaud. (New York: Oxford [illegible] versity Press, 1944. 439 pp.) An inclusive [illegible] of the early Republic style.

Mumford, Lewis. THE SOUTH IN ARCHI[illegible] TECTURE. The Dancy Lectures at Alabama Coll[illegible] 1941. (New York: Harcourt, Brace and Comp[illegible] 1941. 147 pp.) Four lectures; considerable d[illegible] sion of Jefferson and Richardson as Southern [illegible] tects. Neat restatement of Mumford's convict[illegible] the social role of architecture.

Pevsner, Nikolaus. AN OUTLINE OF EUR[illegible] PEAN ARCHITECTURE. (London and New Y[illegible] A Pelican Book, Penguin Books, 1942. 139 pp.) [illegible] good brush-up history; rather short on content[illegible] work.

Steinman, D. B. THE BUILDERS OF THE [illegible] BRIDGE. The story of John Roebling and his [illegible] (New York: Harcourt, Brace and Co., Inc., [illegible] 457 pp.) The fascinating story of the Roebling [illegible] tributions to bridge design; tale, of courageous [illegible] struction.

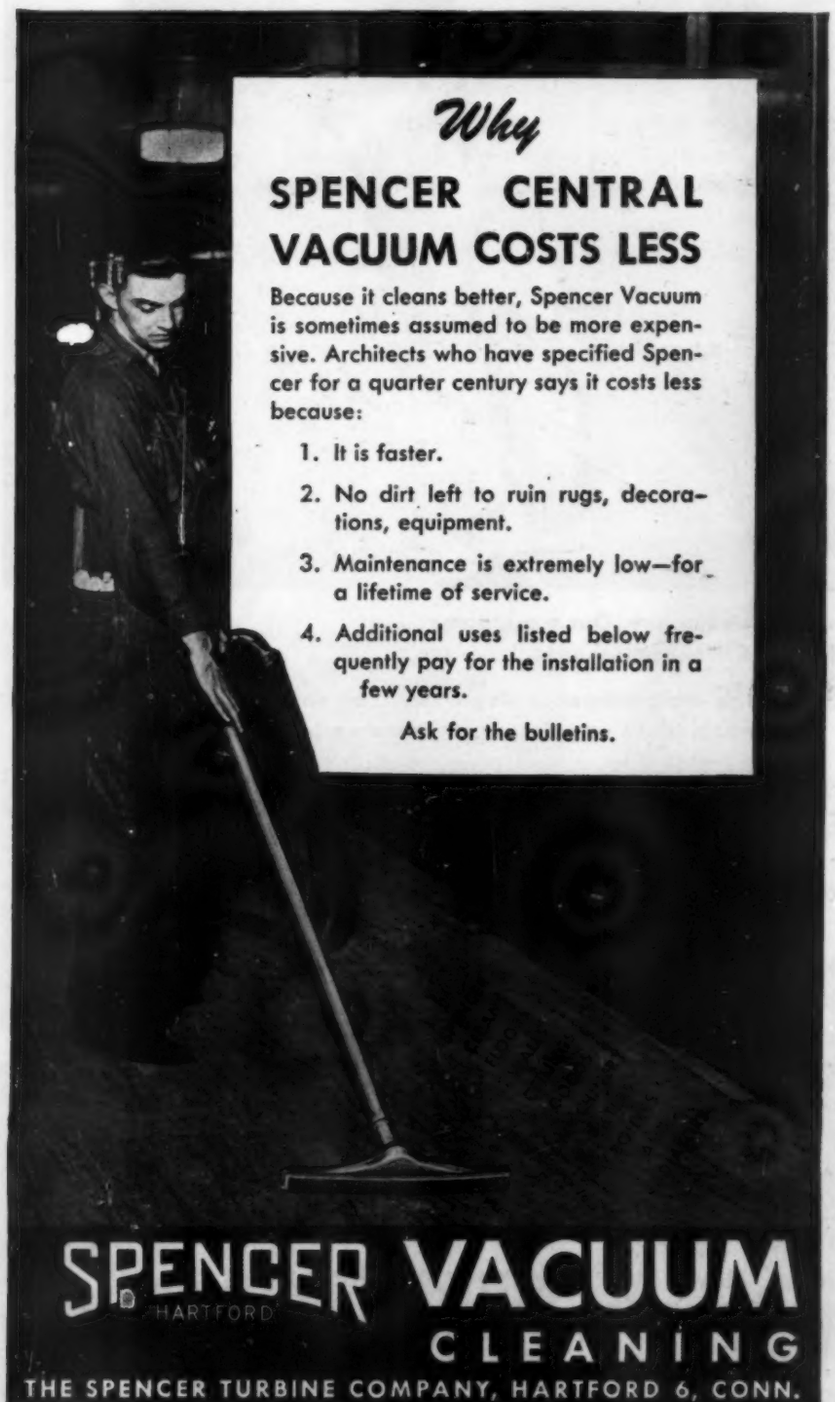
Talmadge, Thomas E. ARCHITECTURE IN [illegible] OLD CHICAGO. (Chicago: University of Chi[illegible] Press, 1941. 218 pp.) A fact-filled recounting [illegible] Chicago's architectural heyday. This is the arc[illegible] tectural background for the Ericsson book.

STANDARDS

Burbank, Nelson L. HOUSE CONSTRUCTION [illegible] DETAILS. (New York: Simmons-Boardman Publish[illegible] ing Co., 1942. 312 pp.) Photographs and diagr[illegible] increase value of working drawings; intended [illegible] for the trades than the architect.

Caudill, William Wayne. SPACE FOR TEACH[illegible] ING. (Agricultural and Mechanical College of Texas[illegible] August 1941. 124 pp.) Superbly presented book [illegible] school building standards based upon experience [illegible] work. An example of the factual background nec[illegible] sary for good contemporary architecture which [illegible] generally lacking in other types of buildings.

(Continued on page 116)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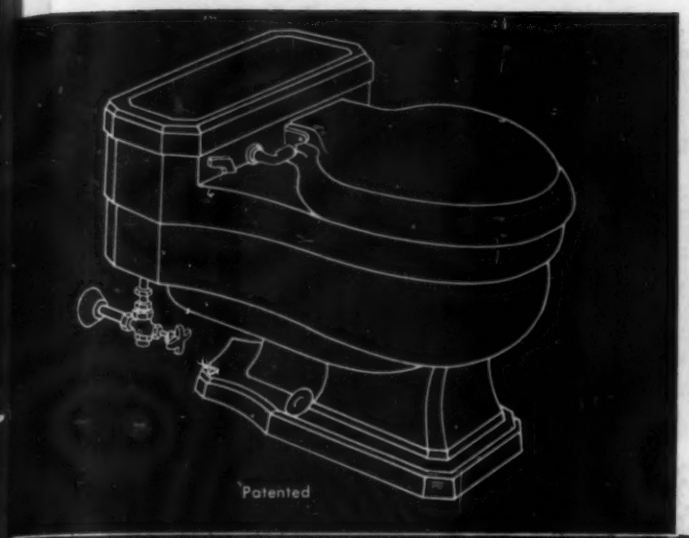

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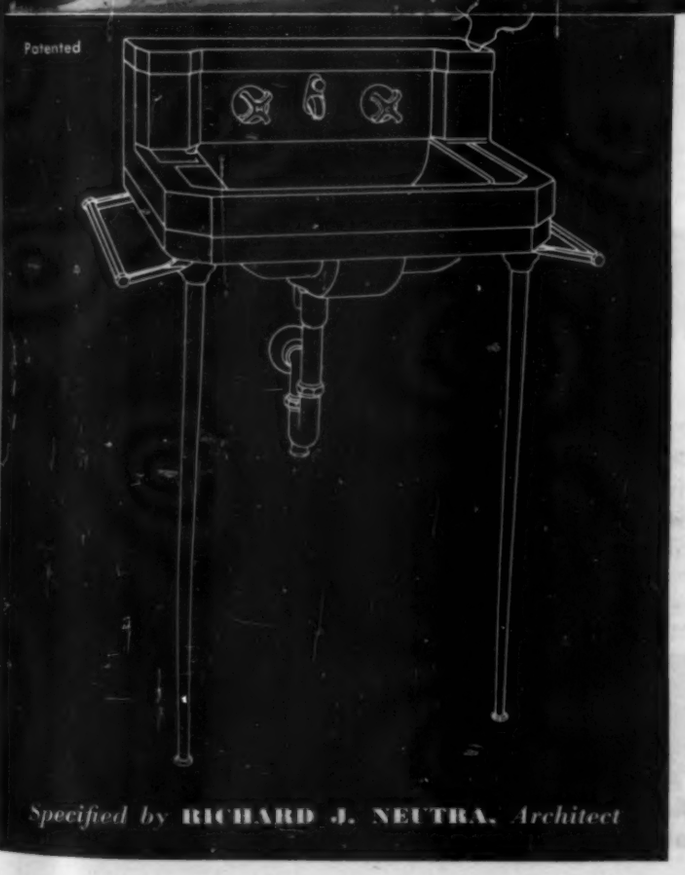

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REVIEWS

(Continued from page 114)

McCall's Magazine.

WHAT WOMEN WANT IN THEIR BEDROOMS OF TOMORROW. 117 pp.

WHAT WOMEN WANT IN THEIR DINING ROOMS OF TOMORROW. 139 pp.

WHAT WOMEN WANT IN THEIR KITCHENS OF TOMORROW. 173 pp.

WHAT WOMEN WANT IN THEIR LIVING ROOMS OF TOMORROW. 141 pp.

(New York: McCALL'S Magazine, 1944.) Results of McCALL'S contest on home architecture. Valuable guide for apartment, subdivision, and prefabrication designers.

PRACTICE

Lescaze, William. ON BEING AN ARCHITECT. (New York: Putnam, 1942. 287 pp.) The New York modernist discusses architectural practice—art and business. A fair introduction to the profession for young people.

Wills, Royal Barry. THIS BUSINESS OF ARCHITECTURE. With the collaboration of Leon Keach. (New York: Reinhold Publishing Co., 1941. 210 pp.) Boston's successful architect reveals how the profession may be made to pay. Highlights problems of practice; avoids all issues of design.

Hitchcock, Henry-Russell. IN THE NATURE OF MATERIALS. The Building of Frank Lloyd Wright, 1887-1941. (New York: Duell, Sloan and Pearce, 1942. 413 pp.) A comprehensive picture book of Wright's work. Magnificent achievements of his talent are arranged chronologically.

Wright, Frank Lloyd. FRANK LLOYD WRIGHT,, AN AUTOBIOGRAPHY. (New York: Duell, Sloan and Pearce, 1943. 561 pp.) An egotist's story. Mr. Wright *is* far more creative as an [illegible] than as an author.

Wright, Frank Lloyd. FRANK [illegible] WRIGHT ON ARCHITECTURE. SELECTED [illegible] INGS 1894-1940. Introduction by Frank [illegible] (New York: Duell, Sloan and Pearce, 1941. [illegible] Wright's social and architectural philosophy, spairing of the city accepting Wright, Wright ishes the city. His Broadacre City is not [illegible]

Wright, Frank Lloyd. WHEN DEMO[illegible] BUILDS. (Chicago: University of Chicago [illegible] 1945. 131 pp.) A shortened restatement of [illegible] Architecture. Our oppressive society is disinte[illegible] Organic Architecture (apparently the handm[illegible] Democracy) will permit establishment of [illegible] humane world. Ruskin-like fear of machines a[illegible] ness dwarfs Wright's social horizon.

PICTURE BOOKS NOT OTHERWISE NOTED

Bill, Max, et al, Editors. MODERN [illegible] ARCHITECTURE. (Basel, Switzerland: Karl W[illegible] 1938. A folio.) Excellent photographs of [illegible] buildings. Detail drawings and background notes [illegible] tribute to the usefulness of this folio series o[illegible] temporary Swiss architecture. No comparable [illegible] other countries has yet appeared in English.

Bromberg, Paul. ARCHITECTURE IN [illegible] NETHERLANDS. (New York: Netherlands Info[illegible] tion Bureau, 1944. 90 pp.) This semi-official [illegible] publication shows more good contemporary d[illegible] than a comparable American publication might, [illegible] ing emphasized.

Goodwin, Philip L. BRAZIL BUILDS. [illegible] tecture New and Old, 1652-1942. Photographs [illegible] E. Kidder Smith. (New York: Museum of M[illegible] Art, 1943. 198 pp.) Grand pictures of early co[illegible] and recent contemporary buildings in Brazil. [illegible] spiring newer work has become familiar since [illegible] publication.

Mock, Elizabeth, Editor. BUILT IN [illegible] U.S.A., 1932-1944. Foreword by Philip L. Goo[illegible] (New York: Museum of Modern Art, 1944. Ill[illegible] The Museum's picture summary of outstanding [illegible] temporary buildings is America's first publicati[illegible] this type. Possibly the paper shortage accounts [illegible] the rather brief coverage of each building.

Nicholson, Emrich. CONTEMPORARY SH[illegible] IN THE UNITED STATES. Foreword by C[illegible] Nelson. (New York: Architectural Book Publi[illegible] Co., Inc., 1945. 192 pp.) Picture book of m[illegible] shops. Most are good examples.

Revere Copper & Brass, Inc. REVER[illegible] PART IN BETTER LIVING. (New York: Re[illegible] Copper and Brass, Inc.) A series of 25 small book[illegible] presenting some novel and always interesting m[illegible] tectural projects by some outstanding architects.

Yorke, F. R. S. THE MODERN HO[illegible] (Cheam, Surrey, England: The Architectural P[illegible] 1944. 5th edition, 224 pp.) Superb picture book [illegible] contemporary home architecture the world o[illegible] Simple text; interesting detail plans and pictures [illegible] cluded. New prefabrication section is a useful m[illegible] of architectural ingenuity.

"POPULAR" ARCHITECTURE

Creighton, Thomas H. PLANNING TO BU[illegible] (New York: Doubleday, Doran and Co., 194[illegible] pp.) A rarity among popular "how to build y[illegible] home" books—it's amusing and modern. May edu[illegible] the public to better architecture than most p[illegible] titioners can offer.

Nelson, George, and Wright, Hen[illegible] TOMORROW'S HOMES. Foreword by Howard My[illegible] (New York: Simon and Shuster, 1945. 214 p[illegible] Pictures and text carry the fight for good mo[illegible] architecture right to the client.

Johnstone, B. K., and Associates. BUI[illegible] ING OR BUYING A HOUSE. A Guide to Wise [illegible] vestment. (New York: Whittlesey House, McGr[illegible] Hill, 1945. 154 pp.) A sober and useful guide [illegible] prospective home owners. (For a discussion of ho[illegible] ownership hazards see John Dean's HOME OWNER[illegible] IS IT SOUND?, PLANNING BIBLIOGRAPHY, January 19[illegible]

AND IN GENERAL —

Sert, Jose Luis. CAN OUR CITIES SURVI[illegible] An ABC of Urban Problems, Their Analysis, [illegible] Solutions. (Cambridge, Mass.: Harvard Univer[illegible] Press, 1944. 259 pp.) Invaluable introduction [illegible] planning needs and aims. Outlines the archite[illegible] role in creating a healthy urban atmosphere. (P[illegible] PLANNING BIBLIOGRAPHY, January 1946.)

(Continued on page 118)

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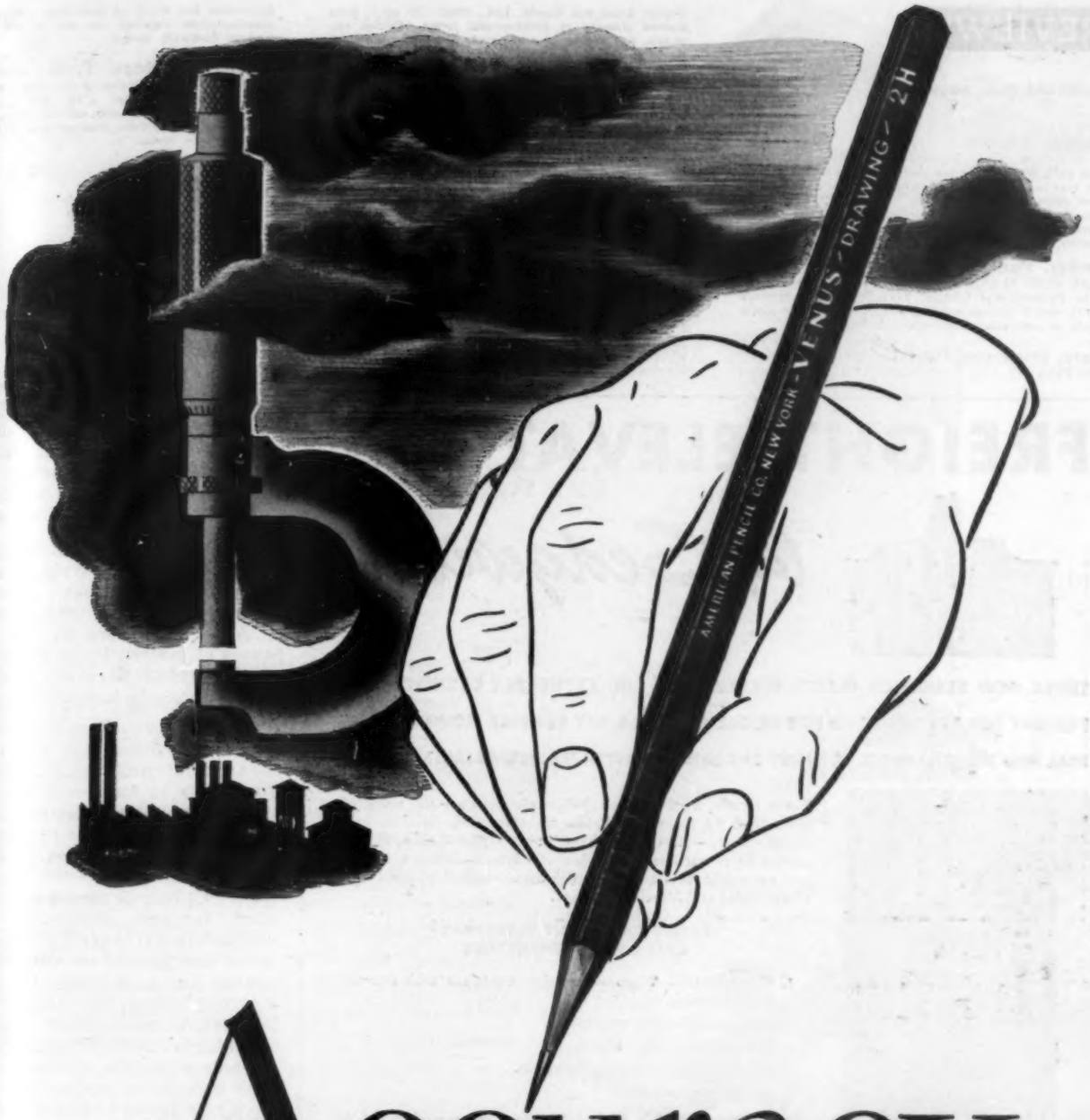

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REVIEWS

(Continued from page 116)

Violich, Francis. CITIES OF LATIN AMERICA. (New York: Reinhold Publishing Co., 1944. 241 pp.) Mr. Violich traveled through Latin America; he met many of the outstanding architects, engineers, and planners "to the South." Here are his favorable reactions to their work with emphasis on public architecture and housing. (See PLANNING BIBLIOGRAPHY, January 1946.)

Zucker, Paul, Editor. NEW ARCHITECTURE AND CITY PLANNING. A Symposium. (New York: The Philosophical Library, 1944. 694 pp.) Sections I, II, and V discuss architectural problems from materials to esthetics. The survey is spotty.

Ware, Dora, and Beatty, Betty. A SHORT DICTIONARY OF ARCHITECTURE. (London: George Allen and Unwin, Ltd., 1944. 107 pp.) Long needed glossary of architectural terms. British emphasis, and neglect of non-structural subjects diminish its usefulness.

INTERIOR DESIGN

Ford, James, and Ford, Katherine Morrow. DESIGN OF MODERN INTERIORS. (New York: Architectural Book Publishing Co., Inc., 1942. 130 pp.) Picture book of American interiors arranged by room type. A few excellent groupings and some very ingenious furniture.

Merivale, Margaret. FURNISHING THE SMALL HOME. (New York: Studio Publications, Inc., 1945. 112 pp.) A picture book of poor-to-good interiors, some modern. Intended for the public.

Noyes, Eliot F. ORGANIC DESIGN IN HOME FURNISHINGS. (New York: Museum of Modern Art, 1941. 48 pp.) Possibly the only publication which attempts to *explain* the design of contemporary furniture—particularly chairs. Little on interior decoration but much on individual pieces. The manufacturers' catalogs are one of few sources of modern furniture design.

Robsjohn-Gibbings, T. H. GOODBYE TO CHIPPENDALE. Illustrated by Mary Petty. New York: Alfred A. Knopf, 1944. 106 pp.) [illegible] divestiture of the traditional decorator has a great moral and esthetic booster for architect, [illegible] and furniture dealer.

HOMES FOR OUR TIME

Tomorrow's House. George Nelson [illegible] Henry Wright. Simon & Schuster, [illegible] Sixth Ave., New York, 1945. 214 [illegible] illustrated. $3.00

Tomorrow's House is the best of the [illegible] cent books on residential architect[illegible] This rating is merited by its st[illegible] gently realistic approach to mod[illegible] house design, by its soundness and [illegible] ity of thought, by the clarity, li[illegible] ness, and readability of its style.

The authors—George Nelson, consult[illegible] editor, and Henry Wright, manag[illegible] editor of *Architectural Forum*—h[illegible] presented a candid, complete statem[illegible] of facts and views on the intric[illegible] phases of modern house design. Pho[illegible] graphs, over 96 pages of them, and [illegible] illustrations effectively fortify the t[illegible]

The result shows how untenable is [illegible] position of the critics who side w[illegible] the articulate architect from upper N[illegible] York State in his recent attack on [illegible] architectural magazines in general [illegible] that one in particular as being edi[illegible] by journalists, and on architectu[illegible] editors as arrogant bigots in publishi[illegible] stark and barren structures which [illegible] want. Let such persons read past t[illegible] authors' initial warning that the b[illegible] is not for them if its viewpoint see[illegible] strange and unpalatable. As they re[illegible] they will become increasingly aware [illegible] the advantages of modern design. Th[illegible] advantages are persuasively dem[illegible] strated while the authors adhere [illegible] their announced purpose of not dict[illegible] ing a new gospel of house planning, b[illegible] of merely exploring some of the myri[illegible] possibilities of contemporary livi[illegible] habits and industrial techniques in m[illegible] ing houses better and more attracti[illegible]

Tomorrow's House is a dependab[illegible] source of correct information on mode[illegible] house planning, for which a great d[illegible] mand and need exist. Present st[illegible] preferences as sampled by various age[illegible] cies show that only between three an[illegible] five percent of the near-future hous[illegible] will be of modern design. The antho[illegible] gies of sweet, romantic period piece[illegible] the cheap paper-bound collections [illegible] house plans, and all the others of thi[illegible] kind which, from newsstands and maga[illegible] zine racks, ogle the unwary millions a[illegible] setting a sorry pattern for the nation[illegible] houses. Here is an efficient antidote.

Current periodicals further show t[illegible] need for such a reliable interpretati[illegible] of modern design principles as th[illegible]

(Continued on page 120)

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by Sedgwick

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ROLLING DOORS

REVIEWS

(Continued from page 118)

book. Routine objections to open plans, to cellarless, attic-less, and glass-walled houses frequently appear. Modern design is often confused with the international style, with the "machine for living" idea, with factory patterns for prefabrication. Recently an associate editor of one of the older, conservative monthlies, in belittling the attempts of modern architects, singled out for attack on vague sentimental grounds the arbitrariness of the "storagewall" designed by Nelson and Wright. This book should properly reorient much of this careless thinking.

The arrangement of the book's contents is unusual and effective. First, the various basic house functions—living, eating, bathing, sleeping—and their attendant factors of sound and air control, lighting (natural and artificial), heating (solar and artificial), and storage are thoroughly analyzed. The essential features are later assembled into a complete house and set upon a lot, the choice of which is at that point discussed.

Financing is then brought out for consideration. Several inimical specimens are displayed on a pin for study and later avoidance: the run-of-the-mill architect who is "too enmeshed in old-fashioned drafting-room methods and prejudices to be capable of working out your problems with you on a constructive, forward-looking basis;" the old-line builders who, "confronted with anything that deviates a hair's breadth from the way their grandfathers used to do things . . . .let out mighty squawks and proceed to jack up the price;" the banker who "is frequently shocked by the new-fangled ideas people are getting about their houses;" the FHA representative "whose only effective method for handling a difficult situation is to say 'no.'"

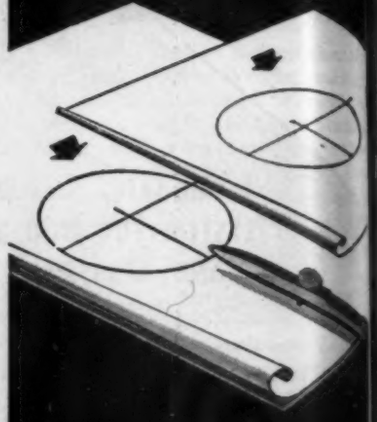
These latter two are frequently antagonistic to modern house planning. The authors should have recommended reading attentively the FHA Technical Bulletin Number 2 (March 1, 1941) entitled *Modern Design*. This 10-page booklet, priced at five cents, contains one of the best short discussions available on the subject.

The last chapter of *Tomorrow's House* exposes the hollow ineptness of so many highly publicized projected advances in home equipment and design, and simply, quietly, sensibly, treats of what these advances should and probably will be.

The names of the architects and photographers whose work is illustrated are grouped in a hard-to-follow index. They should have been arranged so as to

(Continued on page 122)

Tracing cloth that defies time



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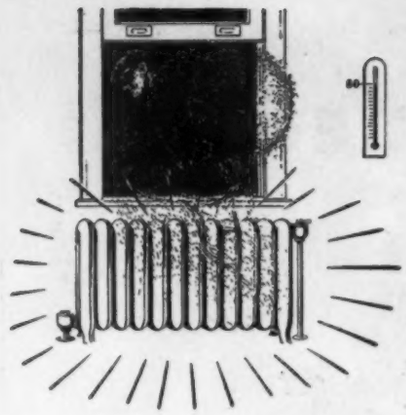

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REVIEWS

(Continued from page 120)

be more easily connected with the illustrated work.

Great encouragement can be found in the book's underlying thesis: "Tomorrow's house needs no new inventions, materials, or techniques for its realization. What is required is a deeper understanding of today's trends, coupled with the most creative and bold use of the techniques already at hand." A concluding statement of the book makes a sound beginning for further thought on the subject of house design: "Almost all of our dwellings, even the new ones, are ten to fifty years behind what they could be."

LAWRENCE E. MAWN

NEGLECTED ADVICE

Georgia's Planting Prelate. Hubert B. Owens. University of Georgia Press, Athens, Georgia, 1945. 56 pp.

In 1851 the Rt. Reverend Stephen Elliott, Jr., spoke before the Central Agricultural Society of Georgia on Horticulture. He was the planting prelate; and his talk is reprinted in full in Mr. Owens' book.

It is an interesting talk, not only in the Reverend's allusions to historically antique ideas and events, but in his description of the lush sub-tropical flora native to Georgia. The prelate's ideas were very sensible—to take greatest advantage of the Georgian climate; he declaimed against the construction of English-style houses—sans ventilation—in an area corresponding to the South of France and Italy; he pleaded for the cultivation of appropriate fruits, melons, and flowers.

DAVIDSON-SMULL

ADAPTABLE AID

Production Illustration. John Treacy. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1945. 202 pp., illustrated. $4.00

A new factory-tested guide for preparing perspective illustration—so widely adopted by leading industries due to war needs—has been produced by an instructor of Escola Technica de Aviacao at Sao Paulo, Brazil. He was formerly production illustration engineer for Douglas Aircraft Company. This is a book that will prove valuable to those interested in this particular field. The exposition of production illustration from all pertinent aspects is clearly demonstrated—and readily adaptable to any product.

E. A. BENNETT

(Continued on page 124)

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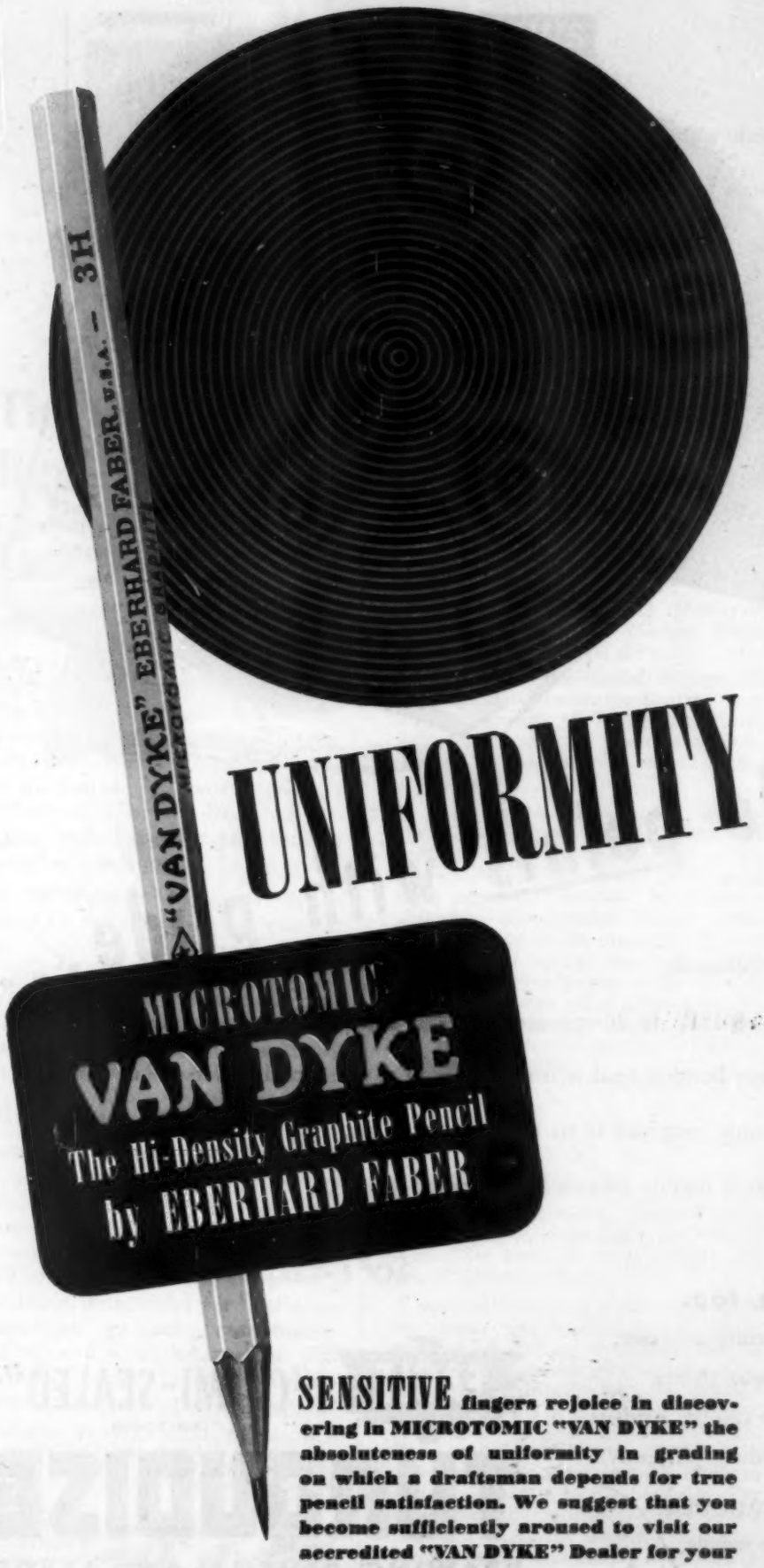

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REVIEWS

(Continued from page 122)

PERIODICALS

Reviewed by
MAUDE KEMPER RILEY

THE ARCHITECTURAL REVIEW
45 The Avenue, Cheam, Surrey, Englan
DECEMBER 1945

The Gothic revival, revaluated in
light of the modern movement, now
tablished as the style of England,
the subject of this issue. The presen
tion is made for the purpose of aidi
in classifying the embroideries of su
period imitations of the Gothic as ha
left their trails throughout Englan
the rococo, the romantic, the Victori

Strawberry Hill, the little house W
pole bought in 1747 and converted in
a Gothic villa, was the design that
tablished the style in England. Ben
ley's rococo bent was impressed upon
This was Act I of the three-act pla
Act II gives Goethe's enthusiasm f
Strassburg in a translation of a studie
essay—and, as Scene 2, Rickman's S
John's College. The three scenes of A
III feature William Butterfield's mi
nineteenth century church work, New
man's Littlemore church, and Pusey
presentation church, St. Saviour's
Leeds, just 100 years old.

HOUSE BEAUTIFUL
572 Madison Avenue, New York 22, N. Y.
DECEMBER 1945

Dorothy Liebes, well known Californi
designer and textile expert, points t
the fact that "treasures" of heirloo
quality are being designed today by a
ever growing body of craftsmen wh
work (singly) in groups wherein idea
and equipment are pooled: under schoo
leadership, as at Black Mountain Col
lege, or with such leaders as Glen
Lukens or Millard Sheets. And then
are regional guilds of craftsmen, too
from Cape Cod to Oregon. This is
Christmas issue and the plea is for gif
buying from the makers of tomorrow
museum pieces and prized antiques—
an apt association of ideas. Illustration
are numerous and of good variety.

The urge to own a home will no doub
override all cautionary articles telling
why 1946 is not, or may be, a good yea
to build. But this issue at least goes
on record in giving its readers severa
sides of the question. Miles Colean's
Rules 1 to 7 are elemental. They star
with "hire an architect" and recommend
that all savings be put into an equity
for future protection against defaul

(Continued on page 128)

For Modern School Roofs—
PC FOAMGLAS Insulation

The roof of the new West Seneca School, at Orchard Park, New York, is insulated with PC Foamglas. This retards heat travel into and out of classrooms, protects the health of teachers and pupils. Architect, Roswell Pfohl, Buffalo, New York — Roofer, Power City Roofing Company, Buffalo, New York.

This picture shows how PC Foamglas Insulation is applied and how roofing is built up. Concrete slabs are covered with hot pitch or asphalt. Then, in turn, PC Foamglas, pitch or asphalt, four plies of roofing felt, pitch or asphalt and gravel are applied. All sorts of flat deck roofs, on all sorts of buildings all over the country, have been insulated—for good—with PC Foamglas.

Providing a firm, level base for roofing felt, PC Foamglas, the permanent insulation, can be cut quickly to fit around openings and obstructions right on the job, with ordinary tools. When you are figuring a roof insulation job, figure on the most efficient, the most economical material—PC Foamglas.

ONE of the problems which faced the builders of this new, modern school was the selection of an efficient insulating material for the large area of flat roof. They solved it effectively, economically, *permanently* by specifying PC Foamglas Insulation.

Made of air-filled glass cells, PC Foamglas does not warp, shrink, swell, check or rot. It is impervious to moisture, vapor, and the fumes of most acids, elements that cause other materials to lose insulating efficiency.

So PC Foamglas will help to maintain comfortable temperatures in top floor classrooms, winter and summer, throughout the life of the building. Heat losses are reduced, saving fuel, easing the load on the heating plant. Furthermore, the excess heat of the sun does not penetrate the roof to make the rooms too warm for teachers and pupils.

We have published a booklet which contains charts and tables, detailed specifications and clear directions for installing PC Foamglas Insulation. We shall be glad to send you a free copy if you will just fill in and mail the convenient coupon. Pittsburgh Corning Corporation, Room 102, 632 Duquesne Way, Pittsburgh 22, Pa.

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Permanent Insulation	Fireproof	Economical
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REVIEWS

(Continued from page 124)

Old hands at home owning will understand this better than new ones. But second-time adventurers have one advantage this time: their old house can be sold at a definite profit!

ARCHITECT & ENGINEER
68 Post St., San Francisco, Calif.
NOVEMBER 1945

The Washington State Chapter, A.I.A., will exhibit small house plans of the region to assist G.I.s and others attempting to build homes. Prize awards of $50 to $500 will be given, the monies being furnished by the Seattle Trust & Savings Bank. The project is known as the "Stock Plan Selling Bureau," for the plans, whether prize-winners or not, will be available to the bureau to sell to individuals. Plans and six sets of blueprints and specifications will cost the prospective homebuilder $50.

A boom in swimming pool building is expected. Cost of construction, says Edwin H. Wilder in this issue, is lower at present than prewar. Use of materials is better understood. The larger type pool—municipal, institutional, therapeutic, resort, apart- house, etc.—is thoroughly discussed. I perts were consulted and recom- tions are included on location, gra and excavation, structural desig terials, interior finish, site, pipin equipment, wind protection, clea and maintenance costs.

BUILDING & ENGINEERING
20 Loftus St., Sydney, Australia
OCTOBER 24, 1945

The British Ministry of Aircraft P duction offers an aluminum house seven designs which will be supp local authorities under the Tempor Accommodation Housing Act of 19 BAI will build them as it would craft—at headquarters and five cent

Eventual production will reach 5,00 month in a program for 50,000 un Strength and lightness are the ma points offered in construction of th aluminum houses. From these can fashioned structural skeletons such are required for conservatories, booms for draglines, or simple for for doors, windows, floors, ceilin roofs—pots and pans. The four un comprising a house would be hois onto a low brick wall, connected wi tapered pins at floor, wall, and r joints.

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THE SHORTEST DISTANCE BETWEEN TWO POINTS is BELfone

The time you save by using BELfone makes it the shortest distance between any two points—the *quickest* way to get things done in your plant or office. BELfone's instant two-way (talk and listen) vocal contact places any department or executive "just across the desk" from you—assures immediate action on orders or inquiries. No need to wait for messengers or written replies. BELfone also keeps phone lines clear of internal traffic, free for outside calls. Economical standard units combine to fit your exact needs—any number of stations, any type of service, all the latest features. Write for complete details!

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"Talk about going from the ridiculous to the sublime—wait'll you see my postwar Suntile store"

★ WHAT THEY SAW...

A store's outward appearance often spells the difference between success and failure. A step in the right direction is a Suntile storefront. Its colorful design and cheery cleanliness provide eye-appeal that speeds buy-appeal. Suntile laughs at climate. It is a weatherproof, stainproof and colorfast. It will not char, crack, melt or harden. Suntile is durable. Its beauty is permanent. Its long-range economy unequaled.

Suntile also supplies a practical solution for beautiful floors and walls inside the store. It's so easy to clean and keep clean... and it withstands the strain of a lifetime of use. You can add to the appeal of tomorrow's stores by specifying Suntile today.

Suntile

Bright with color-Right for life

Suntile

A Suntile Storefront Is A Stimulant To Sales

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The extra whiteness is

a tangible factor of architectural beauty

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